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THE SALE OF US MILITARY AIRCRAFT TO SAUDI ARABIA

by

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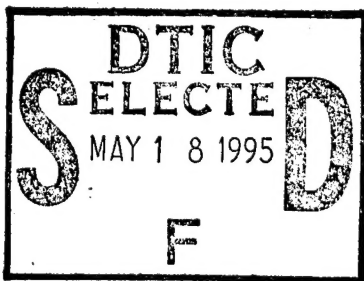
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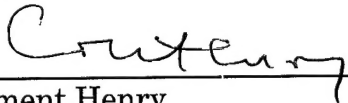
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Chapter 1: INTRODUCTION

The end of the Cold War in the late 1980's resulted in a gigantic downsizing and consolidation of America's defense industries, as domestic demand plummeted and the volume of international arms trading fell to a ten-year low. However, total world arms exports are still measured by the billions of dollars, and the United States exports more arms than any other nation. The country of Saudi Arabia has been the destination of a disproportionate amount of these weapons, purchasing \$30 billion of US weapons since 1990.

The US military aerospace industry, with the high tech, high costs, and high prestige appeal of its supersonic jets and laser-guided "smart" bombs, exports perhaps the most visible and attention-grabbing products on the world arms market today. Aerospace companies such as McDonnell Douglas, Lockheed and Boeing have especially looked to Saudi Arabia and other Middle East nations as important export outlets to help defray their large R&D costs. However, recent events have made the lucrative market of Saudi Arabia less certain. Low oil prices, debt burdens of the Gulf nations from Desert Storm, lessening Arab-Israeli tensions, and congressional and international opposition to aggressive arms marketing would all seem to contribute to a weaker export market.

Can the American military aerospace industry continue to rely on exports to Saudi Arabia? What are the wants/needs/desires of the Royal Saudi Air Force and its government? With the recent Saudi budgetary problems, what aircraft can they now afford? Will the American government continue to be persuaded to market American weaponry to Saudi Arabia in the midst of an era of political flux? Will foreign competition successfully weaken US domination of the Saudi market? These are crucial questions, the answers to which will greatly impact the future size, shape, and makeup of the US and

worldwide military aerospace industries, not to mention the political, economic, and social history of the oil-rich desert kingdom of Saudi Arabia.

The following account is an examination of the US military aerospace industry, the world military aerospace market, US government policy concerning arms exports, and the Saudi aerospace market. Each of these entities profoundly impacts US-Saudi military aerospace commerce. By individually analyzing the above factors, I will demonstrate that the supply relationship between the US and Saudi Arabia is dependent on the convergence of several long-standing and deep-seated aspirations on the part of the three major players; the US aerospace industry, the US government, and the Saudi government. These aspirations can be summarized as follows: The US military aerospace industry's exports are critical to ensure its independent survival, help fund crucial R&D programs, and maintain its world leadership position in the military aerospace market. The US government relies on high-tech arms exports to help maintain a viable defense production base in the US. In addition, it wishes to exert a military presence in the Gulf area and nurture relations with Saudi Arabia in particular as the world's leading oil producer. The Saudi government requires a military defense anchored in high-tech aerospace systems, as well as a dependable and capable military ally such as the US.

This government-industry-government triad contains a distinctive blend of political and economic factors. Aerospace exports to Saudi Arabia are not only a positive influence on the US' balance of payments, but also contribute to the overall health of the defense aerospace industry, with subsequent implications for the enhancement of US national security. In return, the Saudis have comprehensive access to the best aerospace products on the world market, and they secure a deeper commitment on the part of the US to aid the development of a viable military defense of the kingdom.

The key to continuation of US aircraft exports to Saudi Arabia is to concentrate and build on these areas of convergence that exist between the various agendas of the parties involved. Careful consideration of the respective needs, strengths, and weaknesses of the US government, the US aerospace industry, and the Saudi customer is the necessary approach to continued satisfaction for all three parties.

MEASUREMENT PROBLEMS

A caveat explaining some of the legion of measurement difficulties in trying to analyze the world arms trade, and the military aerospace market in particular, will prepare the reader for the statistical methodology in the following account. Hard numbers are very hard to come by in the arms trade. Arms deals are by their very nature often secretive agreements. Although most US foreign military sales are fairly well documented, this is not the case with many other countries. The two agencies publishing what are considered the most credible annual statistics on worldwide military sales are the US Arms Control and Disarmament Agency (ACDA) and the Stockholm International Peace Research Institute (SIPRI). In its annual World Military Expenditures and Arms Transfers, the ACDA employs unclassified input from the US intelligence agencies that is unavailable to other agencies. The SIPRI is an international organization designed specifically to monitor the world arms trade and to propose control regimes. Unfortunately, most of both these organization's statistics detail aggregate national totals of the arms trade in general. Specific weapons systems are not normally broken out. Furthermore, their differing measurement methodologies often result in dissimilar statistics.

As for the aerospace trade in specific, the Aerospace Industry Association's (AIA) annual Aerospace: Facts and Figures provides

good general statistics. However, study of the military side of US aerospace is complicated by the fact that the same companies and conglomerates which manufacture civil aircraft also manufacture military aircraft. Although companies usually divide civil and military in their company organizational chart, the fact remains that much aerospace production and product technology is of a dual nature. A convenient black-and-white separation between the two is not always feasible. Moreover, many US companies such as Lockheed are involved in huge "black" projects¹ which are off the public record on both the government and company balance sheets.

Partly because of the above research limitations, the following will not only use figures from the military aerospace industry proper, but will also employ available statistics from the world arms trade in general. Some analysis of the civil aviation industry is also incorporated, as it bears influence on its military sister. In no way is this work intended to be a statistical proof of anything, nor is it an attempt to set up a comprehensive model explaining US military aerospace exports to Saudi Arabia. Rather the intention is to provide the reader a broad overview of the US military aerospace industry and its relationship to the kingdom of Saudi Arabia in an attempt to increase understanding of the broad trends which shape a complex relationship.

Most analyses of foreign arms sales deliberately place their emphasis on the foreign policy aspect of the business, but current developments on the worldwide scene have shifted more attention to the economic aspects of arms sales. This thesis deliberately pays greater attention to the business side of supplying US military aircraft to Saudi Arabia, foregoing for the most part the usual arguments over the effectiveness of US foreign policy in Saudi Arabia, and the desirability or possibility of conventional arms control in the region. This is not to agree with every decision to sell airplanes to Saudi Arabia, nor is it a dismissal of the importance of closely examining

legitimate policy questions concerning the sale of a very lethal product to a volatile region. It is more a search for the underlying reasons behind the fact that every US administration of the past thirty years, diverse as they have been, has found it within the public interest of the US to sell military aircraft to Saudi Arabia, just as every Saudi monarch of the same period has believed it best to buy these weapons.

Examining the various agendas which drive military aerospace sales to Saudi Arabia is a broad topic, encompassing government-business relations, national security issues, the intricacies of international trade competition, the evolution of the aerospace industry, and the complex relationship between Saudi Arabia and the US. The following account will describe the three major players in the Saudi-US military aerospace trade relationship: the US government, the Saudi government, and the US aerospace industry. Chapter 2 begins this study with a description of the current state of the US military aerospace industry and its increasing dependence on exports. In an attempt to survive the drastic contraction and consolidation of the American defense industry, US aerospace firms are more eager than ever to market even their most capable high tech products to overseas buyers. Chapter 3 describes the world aerospace market of the 1990s, as the few military aerospace companies still remaining all jostle for a shrinking number of overseas sales.

The critical role of the US government in the military aerospace market as customer, promoter, subsidizer and regulator is found in Chapter 4. Chapters 5 and 6 examine the role of both home and host governments in US aerospace sales to Saudi Arabia. Chapter 5 portrays the uniquely important Saudi military aerospace market, and includes the foundational aspects of a US-Saudi military supply relationship that has now lasted over thirty years. It also describes the Saudi's relationship with competing aerospace firms from Great Britain and France.

Chapter 6 concludes this study with illustrations of how the factors which have driven the US-Saudi military aerospace trade in the past may not change any time soon. The respective interests of the US military aerospace industry, the US government, and the Saudi government should continue to intersect in significant ways. The two weakest links in this arms-supply relationship are internal political opposition to the Saudi ruling family, and the uncertain outcome of the continued drawdown of the US military aerospace industry. By focusing on reciprocal benefits and avoiding pitfalls of contention, a mutually beneficial relationship can be maintained well into the next century.

¹ In defense terminology, "black" defense development programs contain technology considered so vital to national security that no information concerning the projects is released into public records. The now-famous Lockheed F-117 stealth fighter was a "black" project for nearly all of the 1980s.

Chapter 2:

THE STATE OF THE US MILITARY AEROSPACE INDUSTRY

The United States military aerospace industry has been in a state of continuous change since the end of the Cold War. The cessation of the US-Soviet Union arms race resulted in a severe drop in domestic and international demand for military aircraft. In response, aircraft manufacturers dramatically downsized their operations, laying off thousands of workers in the process and selling off peripheral divisions in a veritable cost-cutting frenzy. Despite the fact that the industry changes of the past few years have been quite spectacular, historically the military aircraft industry has been since its inception subject to wild fluctuations in demand, tied as it is to the ebbs and flows of international conflicts and tensions.

This chapter will document the current chaotic state of one of the major participants in the US-Saudi military aerospace supply relationship-the US military aerospace industry. Included are general descriptions of the importance of aerospace as one of the US' cornerstone manufacturing industries, aerospace production processes, R&D, finance, employment, and international cooperative efforts.

The primary motivation driving most US aerospace companies is to survive the current aerospace recession and to emerge as a world leader in their field. Declining demand and the ever-rising costs of aerospace technology has resulted in a massive amount of industry consolidation and increased industry dependence on international cooperation, collaboration and exports. Different companies have implemented different stabilization and adjustment strategies¹ to deal with the current crisis. After providing the general industry descriptions mentioned above, this chapter will detail some of these strategies and provide a brief profile of each of America's remaining

primary airframe makers. However, the basic focus of this chapter and the next is on the unique aspects of the military aerospace industry as a whole, not individual firms. As Porter has shown, the optimum unit of analysis in the examination of international trade is the industry. Patterns of international competition differ markedly from industry to industry.² Competitive advantage is won on the industry level as individual firms create unique value in their respective products. The chapter ends with an assessment of the vulnerability of the present competitive advantage in the worldwide aerospace industry currently held by US aerospace firms.

The US aerospace industry comprises a wide-ranging set of companies producing a wide variety of products, to include military and commercial airframes, turbofan, turbojet, and piston engines, space launch vehicles and satellites, a seemingly infinite number of electronic systems, missiles, and helicopters. Although the following will discuss characteristics of the industry in general, this account deals primarily with US prime contractors producing high cost, high-tech military warplanes such as jet fighters and bombers. Although helicopters comprise a significant proportion of worldwide aerospace exports, they are purposely left out of this study because of their dissimilarity to conventional aircraft in form and function. In addition to their traditional warfighting roles, they are often used in police and paramilitary type operations, which are well outside the purview of this study.

It is impossible to accurately analyze the production of military aviation products without incorporating analysis of the production of civil aviation products, a category which includes aircraft used for civilian purposes, as well as aircraft engines and spare parts,³ since both military and civilian aircraft use much of the same technology and are created by the same manufacturers. Both civil and military aviation are interchangeably covered in the following, with special attention being paid to the military side when possible. It should also

be mentioned that many aerospace companies are heavily involved in space and missile programs, neither of which will be dealt with here, except to mention that industry analysts are predicting some continued growth in the space arena in such areas as communications satellites.

AEROSPACE AS US FLAGSHIP INDUSTRY

The United States aerospace industry is perceived and promoted as one the premier manufacturing industries in the country. The aerospace industry is very much considered a high-status business that markets an appealing product which is in demand throughout the developed and developing worlds. US companies such as Boeing and McDonnell Douglas continue to command the world civil aviation market for jet airliners. In the military arena, US aircraft manufacturers have been world leaders in production and exports since the 1960s.

Because of its immense size, current leadership position in the world market, and extensive reliance on cutting-edge technology, the US aerospace industry is consistently identified by economic planners as one of the future foundations of the US economy. US military aircraft manufacturers are currently in position to dominate the world military aerospace aircraft market indefinitely, as the playing field of aircraft producers has greatly narrowed in recent years, with no immediate prospect of any new emerging producers. Political taboos against "merchants of death" exporting weapons to the Third World have greatly receded,⁴ and the US government has become an active promoter of weapons exports to many developing countries.

The health and very existence of US defense aerospace firms has a direct relation to government policy. Although the US government has encouraged competition between individual aerospace companies, and has permitted free enterprise to play a

large role in the development and marketing of military technologies, the US defense procurement system is basically a monopsony as the primary customer for American military aerospace products is the US Department of Defense (DoD). An indigenous and sound production base for military aircraft is considered indispensable for the upkeep of US national security. The maintenance of a technological edge over potential enemies is deemed the crucial factor in the modern battlefield, and under no circumstances would the US military want to see their leadership in this arena slip away to other nations, allied or otherwise.

As an important economic entity, the aviation industry is presently valued more than ever, especially for its contribution to the United States' weak trade balance sheet. From 1982 to 1991, the annual total value of the aerospace industry exports averaged a whopping \$25 billion, equalling almost 9% of the US' total exports during the period, and contributing an average \$17 billion to the US' trade balance every year. 25% of these international sales consisted of military aviation products, amounting to around \$6 billion a year.⁵

The aerospace industry also possess economic importance as an job provider, employing over 1,200,000 million workers, or 6% of the US manufacturing work force (as of 1991).⁶ Many of these workers are highly trained in technical and scientific specialties. Despite the massive size and importance of the US aerospace industry, the actual number of prime contractors in the US military aviation industry that manufacture warfighting jet aircraft has been steadily reduced over the years as individual companies either merged or were sold, until the present time when only four producers remain: McDonnell Douglas, Lockheed, Northrop Grumman, and Boeing. Table 2-1 lists some of the primary systems these companies are currently offering on the world market.

Table 2.1

US Military Aircraft Currently Offered for Export

Company	Model	Type
Lockheed	F-16/F-16X Falcon	air-to-air ground- attack reconnaissance
	C-130 Hercules	transport
McDonnell Douglas	F-18 Hornet	air-to-air ground- attack
	F-15 Eagle	air-to-air ground- attack
Northrop Grumman	E-2C Hawkeye co-produces F-18	AEW
Boeing	variety of transports/tankers/AEW	

Source: Compiled by author from variety of sources.

AEROSPACE PRODUCTION

The production of aircraft is a flexible yet complex process that is highly technology dependent. The following will deal with the importance of R&D to the production of military aircraft, the gigantic capital investments necessary to carry out this R&D, and the key task of properly timing production and technology development. Also discussed are some general aspects of the US military aerospace

production such as prime-subcontractor relationships, the effects of the US defense drawback, finance, employment, internationalization, company stabilization and adjustment strategies, and the nature of the US' competitive advantage in the industry.

Despite the fact that US military aerospace production is approaching an oligopolistic condition with now only four US companies manufacturing military aircraft, and only two major jet engine producers, the inter-company rivalry is intense in most industry segments. Despite what might seem to be assured market shares by these few companies, some analysts believe that there is no American industry of similar size that has been historically so fraught with risk. Some of the risk factors endemic to the production of civil and military aerospace products are: 1) the enormous amounts of capital outlay necessary to research, design, and develop modern aircraft, 2) the cyclical volatility of the aircraft market, 3) rigorous competition on an international scale, 4) the unpredictable impact of political entities upon the production process and marketing, 5) the importance of production timing, and 6) the extensive reliance on hit-or-miss research to obtain a competitive advantage in a rapidly evolving marketplace.⁷

Due to the large size and cost of developing and producing military aircraft, companies often join in partnerships to share the high risks of this kind of development. These strategic partnerships run the range from lead prime contractors with several subcontractors, to "dependent co-producers," in which a company produces an aircraft using another company's technology design, to co-operative primes, in which partnering companies share the risk with varying levels or percentages of participation.⁸ Currently, American firms are more likely to use lead prime or dependent co-producer strategies, although the whole spectrum can be found. McDonnell Douglas alone is currently using all three strategies, taking full responsibility for the F-15, sharing with Northrop some of

the exposure on the F-18 program, and producing the T-45 and Harrier II in a co-producer relationship with British Aerospace (BAe). Smaller European firms have been forced by the rising costs of technology and production to lean towards cooperative prime companies, such as in the case of the coming Eurofighter, a project which combines BAe, Spain's Construcciones Aeronauticas SA (CASA), Messerschmitt-Bolkow-Blohm (MBB) of Germany, and Italy's Aeritalia companies, which have taken on respective 33, 13, 33 and 21 percent stakes in the enterprise.⁹

Subcontractors who supply the crucially important electronic warfare (EW) systems to aircraft manufacturers are an integral part of the aerospace production. In the modern battlefield, the quality and capability of the electronics systems on-board the aircraft such as its radar, electronic counter-measures (ECM), laser designators, infrared devices, and so on are equally if not more critical to battlefield success than the physical capabilities of the airframe such as speed, range, and maneuverability. Although the major airframe contractors manufacture some of their own electronic components, they rely heavily on American EW companies such as Hughes, Raytheon, Litton, Loral, Westinghouse and foreign suppliers like France's Dassault Electronique and Israel's Elta for much of the expensive and complicated electronic equipment in their aircraft.

Much of the fiercest competition in the modern aerospace market is between these EW companies, as they promote their wares to the air forces of the world.¹⁰ Termed the provisions market, these companies compete for the outfitting of the same airframe models, as a single common airframe such as the F-16 or F-18 can accommodate a wide variety of electronic systems. Many of the key technology transfer questions facing today's would-be weapons exporters are in the electronics field, as US government bureaucracies determine which technologies are appropriate for export and which need to be retained in-country in order to preserve national security. This paper

for purposes of brevity will not examine the complex EW arena in detail, but it must be acknowledged that the issues facing the production and export of military aircraft both mirror and intertwine with many of the same issues facing the EW industry. Airframe manufacturers, aircraft engine companies, and EW companies can be classified as a "clustering" of related industries whose individual innovations benefit the entire group, as they enhance the value and subsequent international attractiveness of their respective products.¹¹

AEROSPACE R&D

Research and development programs for modern military aircraft are extremely complex, time-consuming, expensive, and often uncertain processes. As an aircraft progresses through prototype, development, and full-scale production, an aerospace firm invests heavily and risks failure in every stage. For US military aerospace firms, competitive advantage and product value is more dependent on technological innovation than on low-cost production and pricing strategies. The military effectiveness between different generations of aircraft is exponential—one modern F-15 could defeat several of its F-4 predecessors. Once a company successfully produces a new technology, it is not easily reproduced by competitors due both to the economy of scale present in the aerospace industry and to government and industry safeguards against technology transfer.

The continuous demands for technological breakthroughs by the US aerospace industry's outsized domestic Pentagon customer places the military side of the industry slightly outside of Levitt's classical definition of a global industry as an entity that "sells the same things in the same way everywhere."¹² US firms often concentrate on satisfying their primary customer to the exclusion of the world market, especially in the important initial stages of aircraft development. In the process, they often end up designating new

standards for the worldwide industry because of their technological innovations. In the past, US technological efforts have successfully justified dramatic unit price increases to export customers, but has also priced some aircraft such as the Rockwell B-1 and Northrop Grumman B-2 well out of the world market. Thus, the worldwide aerospace market can be considered global as it possesses a significant degree of product homogeneity, but product differentiation in the case of the US goes beyond ideal global marketing models.

The prototype stage is the first step to creating an aircraft, involving the initial conceptualization and "paper" engineering of the a new aircraft, as well as construction and initial testing of the very first prototype. This first prototype will be taken through a variety of wind tunnel tests, component stress tests, hundreds of computer modeling exercises, and many other engineering inquests as designers strive to meet what are often preset performance requirements.

Once engineers believe a prototype has a reasonable chance of meeting target specifications, the aircraft enters the development stage. During development, perhaps the most critical stage is the flight tests, which are divided into two stages. During the development, test, and evaluation (DT&E) stage, a prototype is tested on whether it meets predetermined performance requirements. In the second stage, operational test and evaluation (OT&E), the aircraft is run through simulated combat operations in order to discover how well a pilot could utilize the platform in a wartime setting. While development testing centers around the performance of a machine, operational testing ascertains how effectually real-life pilots are able to fly the aircraft.¹³ Flight testing is a costly, lengthy and grueling process in which test pilots fly thousands of hours on prototype aircraft under the scrutiny of dozens of engineers monitoring aircraft performance and looking for possible trouble signs.

Once a fighter production program is in place, R&D continues as the airplane maker installs progressive improvements and attempts to prolong the production life of the aircraft as long as possible. For instance, the McDonnell Douglas company hopes to continue extending the already twenty-year-old F-18 production line "to 2020 and beyond" with a new F-18E/F version.¹⁴ Often an improved and upgraded version of an older, reliable airframe is sold as a better value for the money than a brand-new, unproven model. Typical improvements include improved engines and more capable electronic systems such as radar, communications, and electronic counter-measures (ECM). Military aerospace R&D is heavily concentrated in the advanced industrial countries, and Todd argues that the progressive nature of high-tech R&D has resulted in a self-perpetuating system in which only very large producers are able to build on present expertise and afford the massive costs of pushing back the limits of current technology.¹⁵

Once past the R&D stages, proven technology is often profitably licensed to outside companies. During wartime production the same technology may be used by several different aircraft makers so as to maximize output. Because most modern nation-states are pushing to increase their national technology base, the majority of international arms transfers now entail a degree of technology transfer. This often involves the licensing of technology by the parent company for production use by another firm located in the importing state. This has been a common phenomenon in the aircraft business, as in the case of the Turkish Tusas Aerospace Industries currently building Lockheed F-16s under license in Turkey.

Accomplishing the right research at the right time and fielding the capability to translate it quickly into production can be crucial to landing a sale. The companies who perform effective R&D in the early stages of a budding technology or future weapon system are often successful in placing themselves in a leading position for successful

marketing of their programs. When the USAF unexpectedly accelerated its acquisition schedule in 1975 for its new lightweight fighter, General Dynamics caught its competitor Northrop flat-footed because it had already been test-flying its prototype YF-16 for several months. Northrop had not even constructed their YF-17 model yet. General Dynamics went on to win the competition, and F-16s have been rolling off the assembly line ever since in possibly the most lucrative fighter production run in history.¹⁶ After missing this opportunity, Northrop and engine-maker General Electric immediately began work on improving the thrust of the YF-17's engines, and this work was lauded as instrumental in the landing the Navy's light fighter procurement contract five months later.¹⁷

CAPITAL AND FINANCE

As defense sales have dropped and arms companies scrounge for means to trim their operating costs, one of the tempting targets has been to slash high-risk R&D budgets. Fixed-price contracting by the Pentagon has pushed many R&D costs from the government to industry. The Pentagon's outlays for R&D during FY94-FY95 alone have been cut by \$16 billion.¹⁸ A continuing sore spot between the aerospace industry and the US government has been the dispersion of public R&D funds. The aerospace industry continues to maintain that necessary R&D expenditures are way too high to be carried by the companies alone, in the interest of national security the government should bear most of the burden. Industry leaders recognize that R&D is essential to their long term health, and state their intentions of continuing substantial R&D investment despite smaller contracts and rising costs,¹⁹ but they also contend that the cost/risk factor for the high level of R&D spending inherent to military aerospace goes well beyond the boundaries of prudent business management. The Pentagon should share with aerospace companies "willing to make

[R&D] investments that produce savings for the government a portion of those savings," says Norman Augustine, CEO of the former Martin Marietta company.²⁰

As previously mentioned, the development of military aircraft necessitates enormous amounts of capital investment. The engineering and manufacturing development (EMD) for the planned McDonnell Douglas F-18E/F model and its GE engines will cost \$4.88 billion, and that is only for an upgrade of an established model.²¹ The R&D costs of developing a fifth-generation fighter such as the F-22 can amount to several times that amount. Development costs are closely linked with DoD procurement procedures. In the early 1970s, the Pentagon changed its procurement policies from buying into a weapon system package on the basis of projected capabilities derived from computer models (called Total Package Procurement), to a "fly before you buy" strategy in which competing companies were required to build and test-fly models in an attempt to more realistically price future aircraft purchases.²² In the late 1980s, the Pentagon revamped its procurement policies again so as to encourage inter-company cooperation and coalitions in competitions for major contracts. In the case of the 1993 competition for the USAF's next fighter, all the major US aerospace companies joined one of two teams. The team approach has helped aerospace companies share the R&D finance commitment necessary to compete for DoD contracts. The Pentagon has also encouraged and actively promoted weapons exports as a means to increase profitability for arms-makers.

Despite these measures, many investors have perceived a general weakening of the financial soundness of many defense aerospace companies. The finance rating of the aerospace company peer group in Moody's Investor's Services group has dropped to Baa1 by 1993, as compared to a A2 rating only nine years ago when America's defense buildup was at its height.²³

EMPLOYMENT

Nearly 15 years ago, aerospace analysts Bluestone, Jordan, and Sullivan predicted that the advent of computerized production techniques, partially caused by the chronic shortage of skilled workers of the time, would result in a severe loss of aerospace jobs when the sales boom of the 1980s ended.²⁴ They were correct. As defense companies have scrambled to stay ahead of the slide in defense and commercial orders, thousands of defense workers have been laid off in recent years. Boeing laid off 24,000 employees in 1993 and the first half of 1994 alone.²⁵ Over 1,200,000 workers were employed in the US aerospace industry as of 1991, a drop of 87,000 from only a year earlier and 130,000 less than in 1989.²⁶ Employment in the US aerospace industry totaled 851,000 workers in 1994, of which around 250,000 (1993) were involved in the manufacture of military aircraft.²⁷ Aerospace industry rolls represents over 6% of the total manufacturing work force in the US.²⁸

The aerospace industry relies heavily on technicians, engineers, and scientists as well as production workers in its workforce, and can be classified as more knowledge-intensive in its production orientation than labor-intensive.²⁹ Over the past ten years, 45% of the typical aerospace workforce has been production workers, 18% scientists and engineers, 7% technicians, and 30% other.³⁰ Most companies have attempted to retain their skilled technicians, scientists, and engineers, and concentrate their layoffs on administrative staff and production workers.³¹

THE INTERNATIONALIZATION IMPULSE

Both the US aerospace industry and the world aerospace industry as a whole have been significantly "internationalized" since the Allied wartime coproduction and export agreements of WW II. An

international focus is imbedded in the very nature of the industry. Despite this long history, however, recent years have seen the internationalization of the aerospace industry reach new levels. The driving force behind this "new" internationalization is the intense competition between aerospace firms as they struggle to obtain competitive advantage in the various aerospace markets of the world.³²

Welch and Luostarinen have defined the basic concept behind the term "internationalization" to be "the process of increasing involvement in international operations."³³ One easy means of determining the degree of internationalization in an industry is to measure foreign sales as a percentage of total sales. In the case of the US military aerospace industry, foreign sales account for approximately a quarter of total sales, clearly placing the industry as well-emplaced in the international environment

The "internationalization" of a firm is also reflected, according to Welch and Luostarinen, in its foreign operation methods, organizational structure, personnel experience, finance, and products.³⁴ Although the aerospace industry thoroughly demonstrates its international character in all of these categories, perhaps the most telling aspect of aerospace internationalization is within Welch and Luostarinen's foreign operation methods category. The remarkable fact is that the internationalization of the aerospace industry has gone beyond simply marketing products in foreign countries to evolve to a state of virtual dependence on international collaboration in aircraft development and production, especially in the civil sector but increasingly in the military as well.

International collaboration between aerospace countries can take many forms, ranging from multi-partner coproduction and development to supplier relationships. In this thesis the term "collaboration" goes beyond co-development, production and licensing

agreements to include all types of international relationships between companies.³⁵

Although the current trend in the world aerospace industry has been towards a contraction in the number of aircraft producers, an opposite dispersing trend has been observed in the location if not number of subcontractors, as the international nature of the aerospace business increases. As the general level of aerospace technology has risen, and the demand for aircraft has dropped, rationalization of the industry has resulted in a decreasing number of producers in certain key areas of technology, especially in electronics and engine technology. But when possible, aircraft manufacturers have attempted to employ a multiple-sourcing strategy to preclude production disruptions.³⁶ In a situation somewhat analogous to today's automotive industry, this has created an unprecedented reliance on international suppliers by prime manufacturers. Despite the dominance of American aerospace in the world market, even by 1980 Bluestone could claim there was no such thing as an uniquely American aircraft or jet engine,³⁷ and international interdependence has only increased since that time.

Concurrently, more and more aircraft-importing countries have sought through international offset agreements a guarantee of aircraft component production within their country. Whether these offset agreements involve co-production, licensed production, or joint ventures, these importing countries hope to provide a technological boost to their domestic manufacturing industries and to increase employment, as well as improve their trade balance sheet performance. Aircraft manufacturers are attracted to these agreements as they facilitate access to lucrative export markets and can be a source of capital, which American companies sometimes have difficulty raising due to anti-trust laws.

Not only has international cooperation taken place on the contractor-subcontractor production level, but the rising costs of R&D

has resulted in an increase in internationally coordinated aerospace research. Lockheed's new F-16X model, for example, employs many enhancements derived from cooperation between Lockheed and Japan's FS-X program.³⁸ American companies have also been key players in Taiwan's indigenous fighter program, as well as Israel's Lavi program, which was aborted in the 1980s.

These large-scale international fighter development programs have raised serious questions concerning the possibility of excessive technology transfer, in regards to both the preservation of US national security and the protection of America's competitive edge in the aerospace field.

FALLOUT FROM THE DEFENSE SHAKEDOWN

The end of the Cold War caused the greatest downturn in the defense aerospace market in American history. The "peace dividend" from the resultant slash in the US military expenditures was a boon for the US government budget, but it sounded a death knell for the independent existence of most defense aerospace companies. Subsequent consolidation and rationalization of the industry resulted in an unprecedented low total of four US military aircraft manufacturers, Lockheed Martin, Northrup Grumman, Boeing, and McDonnell Douglas. Since 1988, annual sales to the US military have fallen almost \$14 billion, and now account for only 40% of the aviation industry's total sales, as compared to 56% in 1987.³⁹

Unfortunately for aircraft makers, the market for civil aviation products is contracting simultaneously with the downturn in the defense market. The lack of commercial orders has resulted from the general unprofitability of the worldwide airliner business in recent years, and sales are not expected to rebound for a couple more years. Because of this dual downturn in the aerospace market, the \$80 billion total orders for aerospace products in 1993 was only half of the 1989

total. The backlog of unfilled orders dropped \$53 billion from 1991 to the end of 1993, contracting to a total of \$188 billion.⁴⁰ The industry has had no choice but to downsize, as there was no possible way for all of the aerospace firms of the 1980s to maintain an independent existence into the next century, which is when the industry downturn is expected to bottom out.

The US government has not made any attempt to manage the defense consolidation process, other than a token effort by the Clinton administration to assist in conversion from defense production to civilian production. Free market forces have forced the hand of many of these companies, and there has been a remarkable succession of mergers and acquisitions in the past five years. Among the more notable acquisitions and mergers are: Northrop acquired Grumman, Martin Marietta merged with GE Aerospace, Lockheed acquired General Dynamics' tactical aircraft division, Hughes Aircraft acquired GD's missile division, Carlyle Group/Northrop acquired LTV's aircraft division, Loral acquired LTV's missile division, and Lockheed merged with Martin Marietta.⁴¹ The rationalization of the US aerospace industry has been a gradual trend since the 1960s, as Table 2-2 demonstrates, but recent market pressures have contracted the playing field in an accelerated fashion to a new, all-time low.

Table 2.2 US Aerospace Rationalization

Type	1960	Aircraft 1966	Companies 1976	1986	1995
Fighter/ Attack	Douglas GD Grumman Lockheed LTV McDonnell N.American Northrop Republic	Cavalier Cessna Douglas GD Grumman Lockheed LTV MD N.American Northrop	Cessna Fairchild GD Grumman LTV MDC Northrop	GD Grumman MDC Northrop	Lockheed MDC NG
Bombers/ ASW	Boeing Douglas GD Lockheed N.American	GD Grumman	Grumman Lockheed Rockwell	Grumman Lockheed Northrop Rockwell	Lockheed NG
Military Transports	Boeing Cessna Douglas Fairchild GD Grumman Helio Lockheed	Beech Boeing Douglas Grumman Helio Lockheed	Boeing Fairchild Lockheed MDC	Beech Boeing Gates Grumman Gulfstream Lockheed MDC	Lockheed MDC Learjet
AWACS/AEW	Lockheed	Boeing Grumman	Boeing Grumman	Boeing Grumman	Boeing NG
Trainers	Cessna N.American Northrop	Beech Cessna N.Amer Northrop	Beech Boeing Cessna	Beech Cessna Fairchild Pipe	Beech

Source: Todd in Defence Industries, p. 99, compiled by author.

Free-market competition in every category of defense production may not survive the defense consolidation endgame. Although probably two to four aerospace companies will remain, the US may drop down to only one submarine manufacturer and one tank maker before the end of the 1990s.

STABILIZATION AND ADJUSTMENT STRATEGIES

In their article "The Economics of the West European Arms Industry," authors Anthony and Wulf have enumerated eight strategies that arms companies are employing to counter the current defense procurement situation.⁴² Although Anthony and Wulf dealt primarily with European arms companies in this article, several of their strategies have been heavily utilized by American aerospace companies facing market pressures similar to their European competitors.

Anthony and Wulf subcategorized their eight strategies under the terms "stabilization" and "adjustment." Companies employ stabilization strategies to stabilize and possibly increase their respective market share in the face of demand contraction. Alternatively, or concurrently, companies use adjustment strategies to scale down or completely cease their arms production. The former subcategory includes: 1) mergers, take-overs, and the formation of new companies, 2) strategic alliances, 3) concentrating on high-demand items, 4) increased exports. Strategies listed under the adjustment category are: 5) employee lay-offs, 6) sale of production facilities, 7) diversification, or conversion to civilian production (which probably should be listed as separate categories) and 8) disarmament activities, such as weapons destruction and treaty verification.⁴³

The various US military aerospace companies have utilized one, several, or all of the above strategies, except for wide-scale defense conversion and disarmament activities. All have been involved in

large mergers and acquisitions in the past five years. As aircraft makers downsized and consolidated their operations, thousands of defense workers were laid off as aerospace companies concentrated on cutting costs to preserve profit margins. As of January of 1995, the aerospace employment figures totaled 851,000 workers, a drop of nearly half a million from 1989, when 1,331,000 people worked in the aerospace industry.⁴⁴ Aerospace companies also cut costs by slowing production, shortening employee workweeks, and reducing expenditures on new plants and equipment, as well as R&D. Several companies have concentrated on improvement of their manufacturing processes, eliminating inefficiencies and, in some cases, re-engineering assembly equipment.⁴⁵ The importance of exports to aircraft manufacturers reached a new level as makers have sought to keep their assembly lines open in the wake of a shutdown of orders from the Pentagon. The Pentagon is counting on 25% percent of future US military production to be exported,⁴⁶ as domestic demand alone may not be enough to keep the military industrial complex healthy.

Conversion to production of civilian goods was not considered a viable option by most defense companies, contrary to the hopes of some economic planners and arms-control enthusiasts. A few academics have called on the Clinton administration to spend up to \$3 billion for the conversion of the US defense industrial base to civilian production.⁴⁷ The problem is that defense conversion has never been shown to profitably work on a large scale. As Norman Augustine, CEO of Martin Marietta stated in a Foreign Affairs article, "The record of massive defense conversion is one unblemished by success... The reason for this solid record of failure is simple: defense work has little in common with civilian work."⁴⁸ Most companies chose the opposite strategy of concentrating on what they were good at, the manufacturing of defense products. Many streamlined their operations, selling off divisions not in their core area.⁴⁹

Another strategy that could be added to the eight listed above is the effort by American aerospace companies to revamp their troubled relationship with their primary customer, the US government. This includes greater funding from the government for the high-risk R&D efforts so necessary to stay on the cutting edge of military technology, procurement reform, greater access to depot maintenance work presently performed by the US armed services, and more government promotion of military exports.

The drastic measures aerospace companies have taken in response to the crash in demand have proved profitable on their balance sheets. In 1993, as percentages of assets, equity and sales, profits grew to 4.2%, 16.2%, and 5.1%, the highest profit margins seen in the industry for a decade.⁵⁰ Several aerospace companies have repurchased stock and reduced overall debt.⁵¹ Stock values have risen accordingly in the last two years, driven by speculators hoping to profit from increased cash flows and consolidations.⁵² Other investors have remained wary as the defense industry contraction continues and worldwide aerospace sales remain weak. The effectiveness of these cost-cutting measures has probably peaked, so future prospects of earnings remain flat as demand for military aircraft will stay low. Many analysts believe the most promising growth will be in non-defense products and technology, which is good news for companies with commercial products such as McDonnell Douglas and Boeing, but less hopeful to companies with a heavier military orientation such as Lockheed and Northrop Grumman.

The following company profiles provide brief descriptions of all four US prime military aircraft companies and demonstrate how they have coped with the defense drawdown by drawing on the strategies described above.

COMPANY PROFILES

McDonnell Douglas. Manufacturer of both the F-15 Eagle and F-18 Hornet fighter aircraft, McDonnell Douglas (MDC) shook off some rather severe financial difficulties in the late 1980s and early 1990s as it simultaneously conducted four fixed-cost development programs. In mid-1990 CEO John McDonnell took drastic action, slashing MDC's work force by 40% and selling off non-core assets. The effort was successful, as operating costs were eventually reduced by \$700 million annually, placing the company in a sound position to become a major leader in defense aerospace well into the next century. The company generated \$396 million in earnings in 1993, despite paying a \$320 million tax bill in the third quarter alone, and its stock went up 125%.⁵³ McDonnell Douglas was the top DoD contractor in 1992 and 1993, landing \$7.5 billion of Pentagon contracts in 1993, amounting to 6.09% of total DoD prime contracts.⁵⁴ The company's fortunes were bolstered in a major way by the \$9 billion F-15E order completed by Saudi Arabia in 1993, as well as a concurrent \$2 billion order placed by Israel. The 20-plane Israel deal came only after a bitter showdown between McDonnell Douglas and its rival Lockheed, who marketed an improved version of the F-16 as an alternative to the MDC F-15E for meeting the Israeli Air Force requirement for a long-range ground-attack aircraft.

Although McDonnell Douglas has done well in the military arena, its commercial sales have been sluggish, especially in comparison to rival Boeing. In 1993, McDonnell Douglas suffered a net loss in commercial plane orders because of cancellations, but Boeing picked up 34 new orders.⁵⁵ McDonnell Douglas normally relies on commercial sales for a third of its revenues.⁵⁶ Some industry observers believe there is only enough room in the world commercial market for two jet makers, Boeing and Airbus,⁵⁷ and if McDonnell Douglas is to continue to manufacture commercial aircraft it may

have to take on foreign partners.⁵⁸ The company is currently targeting its helicopter and satellite divisions as potential growth areas, abandoning its 1980s strategy of diversification in favor of concentrating on its aerospace core. The company is also open to the possibility of joint ventures with foreign partners in the commercial aircraft business.⁵⁹ The company does have foreign cooperation experience, it coproduces with British Aerospace (BAe) both the Harrier II vertical/short-takeoff and landing (V/STOL) fighter and the T-45 Goshawk trainer.⁶⁰

Lockheed Martin. In August of 1994, Lockheed merged with Martin Marietta (MM) to form one mega-company which will annually turnover \$22.5 billion and employ 170,000 people.⁶¹ The deal breached its final anti-trust obstacle on March 14, 1995, clearing the way for the new Lockheed Martin company to become perhaps the largest defense company in history.⁶² Lockheed generated close to a \$800 million profit in 1993 and is expected to continue to annually earn around the \$1 billion level for the rest of the 1990s due to its acquisition of Martin Marietta.⁶³ Lockheed was the second largest DoD contractor in 1993 with a total of \$6.9 billion in Pentagon contracts, second only to MDC.⁶⁴ Their rankings are reversed if measured by worldwide sales. In this category Lockheed totaled \$10.2 billion as compared to MDC's \$9.05 billion.⁶⁵

In the early 1990s, the former Martin Marietta company, through acquisitions of its own, had become the largest defense electronics company in the world, and ranked #1 in 1993 R&D contracts awarded by the Pentagon in Research, Development, Test and Evaluation (RTD&E) program. MM's share totaled almost \$2 billion dollars, more than twice its nearest competitor.⁶⁶ Martin Marietta's charismatic CEO Norman Augustine had become a leader in the post-Cold War industrial world. Under his guidance Martin Marietta merged with General Electric Aerospace in a \$3 billion deal

in April of 1993, and 13 months later acquired the General Dynamics Space division.⁶⁷ MM came close to acquiring Grumman corporation in 1993 in what was termed a friendly takeover, until Northrop stepped in at the last minute and offered a better price.

When Lockheed purchased General Dynamic's Tactical Air Division in March of 1993, it inherited the most numerous American export fighter, the F-16. Presently in the inventory of more than 18 countries, the F-16 program has had 22 follow-on orders from air forces fielding the aircraft, the most follow-on orders of any fighter currently in production.⁶⁸ Although the US military does not presently plan to purchase any more of the aircraft except as possible attrition replacements, the F-16 production line should stay active until at least 1999 as the company works toward eliminating its export backlog of over 500 aircraft.⁶⁹

Lockheed's F-16 plant in Fort Worth, Texas is currently working on the next generation of the F-16 fighter, a derivative model named the F-16X. Designed as a more stealthy and longer-ranged version of the current F-16, the F-16X is to be offered to export customers first.⁷⁰ However, some analysts project that future F-16 sales will be weak, as the world defense market continues to contract and new aircraft.⁷¹

Lockheed also fields the most best-selling transport aircraft of all-time, the C-130 Hercules. In continuous production since the early 1960s, the latest C130J model will begin production in 1997.⁷² Lockheed and project partner Boeing were the winning team in the competition for the USAF's next-generation fighter, the F-22. With 440 on order from the USAF for an estimated per copy price tag of \$100 million a copy, the deal will help carry the Lockheed Martin company well into the next century.

Northrop Grumman. Northrop acquired Grumman, a long-time supplier of naval aircraft, in 1993 for \$2.17 billion, outbidding Martin

Marietta in a month-long struggle.⁷³ The deal probably ensured the Northrop company's future survival in a shrinking pool of defense companies, as some analysts believed Northrop was too small to survive independently.⁷⁴ After the Grumman acquisition, Northrop Grumman grossed nearly \$7 billion in 1993, and expects to continue garnering around \$6 billion annually for the rest of the 1990s.⁷⁵ Northrop Grumman CEO Kent Kresa has gone on record stating that the company is open towards still more acquisitions of firms specializing in defense electronics, military aircraft, or commercial aerostructures, if the venture would complement existing strengths.⁷⁶

Northrop Grumman currently relies heavily on the B-2 bomber for its revenues, a program for which outlays peaked in 1989 at \$5.3 billion, falling in 1994 to \$1.7 billion.⁷⁷ Northrop Grumman is a key player in several surveillance and battle management airborne systems, such as the innovative Joint Surveillance and Target Attack Radar System (JSTARS) program and the E-2C Hawkeye. The company is also a partner in the MDC F-18 fighter program and has a Commercial Aircraft Division which contributes \$1 billion worth of work annually to the Boeing 747, 757, 767, and 777 programs, as well as other commercial aircraft.⁷⁸ Northrop's electronics division is strong, supplying AN/ALQ radar jammers for McDonnell Douglas F-15s, to include both the US and Saudi versions.⁷⁹

Boeing. Primarily known as the world's most productive maker of commercial airliners, the Boeing company is also heavily involved in the world defense market, acting as the primary contractor for many transports, tankers, and AEW aircraft over the years, such as the Airborne Warning and Control System (AWACS), the KC-135 and KC-707 tankers, and many other models. During the 1980s, Boeing was often listed as one of the top five US companies in weapons exports, almost exclusively due to its sale of five AWACS and related air defense equipment to the Royal Saudi Air Force (RSAF). The sale was

part of a \$8.5 billion (1981 dollars) arms package with the Saudis in which Boeing landed between \$1.37 and \$2.57 billion of RSAF AWACS-related prime contracts in 1983-85 alone.⁸⁰ In addition, in 1985, Boeing successfully bid for Saudi Arabia's comprehensive Peace Shield air defense system, a multi-billion ground-based air defense system consisting of an array of inter-connected radars, command, control, and communication centers.⁸¹

Although Boeing will continue to rely primarily on its commercial business, the company will remain a major force in the defense market for years to come. The company's Military Airplanes Division is currently partnered with Lockheed in the development of the USAF's next fighter, the F-22, and also supports a variety of AWACS platforms. Boeing's Helicopter and Product Support Divisions are also involved in the support of a variety of fixed-wing and helicopter programs.⁸²

NATIONAL COMPETITIVE ADVANTAGE

US military aircraft are perceived by many foreign customers as the best value for the arming of their respective air forces. The US military aerospace industry and the US aerospace industry has for a variety of reasons enjoyed a significant competitive advantage over its international competitors, ever since Boeing became one of the first manufacturing companies to export successfully on a truly global basis with its 707 airliner (which was originally a military transport) in the 1960s.

Porter has identified four national attributes or determinants which combine to promote or restrict the formation of a national industry's competitive advantage in the international marketplace. They are: 1) factor conditions - classical factors of production such as skilled labor, infrastructure, and natural resources, 2) demand conditions - in the home country, 3) related and/or supporting

industries - supplier or closely-related industries which are internationally competitive in their own right, and 4) firm structure, strategy and rivalry - Porter's main concern here is the presence of a thriving domestic rivalry between individual firms in the home country.⁸³ These four factors synergize both to carry an industry to international prominence and to speed the decline of an industry that has lost its competitive edge.

In the case of the US, all of the above factors combined in the 1960s to give the US a uniquely capable aerospace industry. Rampant cold war demand by the Pentagon was perhaps the primary driving force behind the aerospace development and growth. Large defense budgets were able to support a healthy number of domestic aerospace rival companies, and production factors such as infrastructure and well-funded university science departments contributed to an industry that requires a deep R&D network. Concurrently, defense electronics and computer firms that supplied aircraft systems pioneered technology that was unavailable anywhere else.

As a result of these favorable determinants, US firms were subsequently able to establish and capitalize on a "early mover" competitive advantage in the burgeoning global market for aerospace products. Porter argues that the "early mover" advantage gives industries important momentum in distribution networks, scale of production, reputation, and experience.⁸⁴

Continued leadership of an established industry rests on constant upgrading, sustained investment in facilities and R&D, and the maintenance of diverse sources of advantage.⁸⁵ Throughout the 1970s and into the defense buildup years of the 1980s, the US military aerospace industry was able to translate massive domestic demand and an established production base into a significant international technological lead in military aerospace, to include the development of foundational innovations such as radar-invisible stealth aircraft and precision-guided standoff weapons that can be released many miles from their target.

Despite this success record, the aerospace industry can not afford to rest on its past accomplishments. According to Porter's model, the continued dominance in the US aerospace sector may currently be in some peril of stagnation. The previously mentioned drastic drop in domestic demand leads the list of danger signs. Secondly, industry mergers and buyouts have created a situation that endangers the continued existence of true domestic rivalry. The sharp segmentation of the aerospace market has already ruled out authentic competition in some of the more specialized types of aircraft such as surveillance, although competition over fighter contracts remains lively. Porter has identified domestic rivalries as extremely important to continued industry innovation, even more important than foreign competition. If an industry can succeed in a tough and demanding home environment, it will probably be able to compete successfully in the international marketplace against inefficient, government-subsidized "national champion" industries that do not face market discipline at home.⁸⁶

The marginalization of some aerospace-supporting electronic defense industries is a third danger sign, as the level of their technology is beginning to be surpassed by civilian applications in some areas. Finally, the general decline in some US production factors, such as the low level of general science education, could eventually play into a stagnant aerospace industry.⁸⁷

Despite these developments, the US' lead in aerospace will not disappear overnight. The real threat is that of a gradual decline. Hopefully the US military aerospace industry will not resort to hiding behind high entry barriers to prospective competitors, short-term profiteering, government protectionism, and the poor performance of over-regulated European competitors, and will legitimately hold its leadership position through continuous technological improvements and other value-creating innovations.

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- 1 In this thesis the word "strategy" will primarily be used in reference to
industry planning and tactics, despite the term's original military
definition.
- 2 Porter, Michael E. "Changing Patterns of International Competition," p.
113.
- 3 Napier, David H., Year-End Review...and a Look Ahead."
- 4 Laurance, Edward J. The International Arms Trade, p. 163.
- 5 Figures were derived from data charts by the Aerospace Industries
Association (AIA) in Aerospace Facts & Figures, p. 120.
- 6 AIA, p. 138.
- 7 For the best overview of the intricacies of the American aerospace
industry, see Bluestone, Jordan, and Sullivan's Aircraft Industry
Dynamics.
- 8 Todd, Daniel. Defence Industries: A Global Perspective, pp. 215-217.
- 9 Todd, p. 217.
- 10 For an overlook of today's EW industry, see Flight International, Mar. 2,
1994.
- 11 Porter, Michael E. The Competitive Advantage of Nations, p. 149.
- 12 Levitt, Theodore, "The Globalization of Markets," in Global Strategic
Management, p. 307.
- 13 Goodwin, Brotherhood of Arms, p. 233.
- 14 Flight International, "Re-newing the Hornet," Feb. 16, 1994.
- 15 Todd, p. 4.
- 16 Goodwin, pp. 217-219.
- 17 Goodwin, p. 227.
- 18 Vadas, David. "US Aerospace Industry's Troubles Continue."
- 19 Norman Augustine speech titled "Future of the Defense Industry," given
to National Press Club, June 7, 1994.
- 20 Augustine speech.
- 21 *Flight International. "Re-newing the Hornet," Feb. 16, 1994.
- 22 Goodwin, p. 211.
- 23 Velocci, Anthony L. "Defense Firms Show Financial Prowess."
- 24 Bluestone et al, p. 179.
- 25 Wolk, Martin. "Defense Companies Seen Benefitting from Cost Cuts."
- 26 Vadas.
- 27 Napier.
- 28 AIA, p. 11.
- 29 For analysis of the global shift from labor-intensive industry to
knowledge-intensive industry, see Drucker, Peter F. "The Changed
World Economy," in Global Strategic Management: The Essentials, pp.
8-9.
- 30 AIA, p. 144.

-
- 31 Napier.
- 32 For an explanation of how competition drives globalization, see Doz, Yves. "International Industries: Fragmentation versus Globalization," in Global Strategic Management: The Essentials, pp. 21-22.
- 33 Welch, Lawrence S. and Reijo Luostarinen. "Internationalization: Evolution of a Concept," in Global Strategic Management: The Essentials, p. 35.
- 34 Welch and Luostarinen, pp. 36-37.
- 35 This is a definition that Hayward states is more common in the US than elsewhere. Hayward, Keith. The World Aerospace Industry: Collaboration and Competition. p. 151.
- 36 Bluestone, p. 80.
- 37 Bluestone, p. 11.
- 38 Aerospace Daily, "Lockheed Planning to Shift to More Capable 'F-16X,' Exports Planned First," Jul. 8, 1994. The FS-X is Japan's first attempt since WW II to design and manufacture an indigenous fighter aircraft.
- 39 Vadas.
- 40 Napier.
- 41 Napier.
- 42 Anthony, Ian and Herbert Wulf. "The Economics of the West European Arms Industry." In Restructuring of Arms Production in Western Europe, pp. 24-30.
- 43 Anthony and Wulf, pp. 24-29.
- 44 Vargas.
- 45 Velocci.
- 46 Vartabedian, Ralph and John M. Broder, "U.S. Weighs New Arms Sales Policy."
- 47 Evans, David. "Wounded Defense Industry Sets Its Sights Abroad," p. 16.
- 48 quoted in Zakheim, Dov. "Industry Will Reshape Itself; But Government Must Still Assist Foreign Sales."
- 49 See Betts, on McDonnell Douglas restructuring tactics, to include an abandonment of diversification.
- 50 Napier.
- 51 Napier.
- 52 Velocci.
- 53 Velocci, Ellis, James E.. "McDonnell Douglas: Unfasten the Seat Belts."
- 54 Finnegan, Philip. "McDonnell Once Again Tops DoD Contractors: Lockheed Moves Up to No. 2 Position; GE, Boeing Fell from Top 10 Rankings."
- 55 Ellis.
- 56 Flannery, William. "McDonnell Cruising Atop Defense World."
- 57 Hage, David. "Washing Away the Pain."

-
- 58 Flannery, "McDonnell Cruising.."
59 Betts, p. 28.
60 Flannery, "McDonnell...".
61 Sarkar, Salil. "Big is Beautiful for Arms Makers."
62 Mar. 15, 1995 CNN Headline News broadcast.
63 Velocci.
64 Finnegan, "McDonnell...", p. 25. This figure may be distorted as Lockheed is heavily involved in classified "black" contracts, the cost of which do not appear on official DoD documentation.
65 Flannery, William. "Lockheed Overtakes McDonnell to Become No. 1 Defense Firm."
66 *Aerospace Daily. "Pentagon's Top 500 RDT&E Contractors."
67 Walker, Karen. "A Friend in Need?"
68 Business Wire. "Lockheed Corp. Cites Strong Performance of Fort Worth Co. on First Anniversary of Acquisition."
69 *Aerospace Daily, "Lockheed Quotes Fixed Price for F-16 to Grease 'in Kind' Replacement."
70 The USAF will have the option to buy the F-16X if it opts to replace attrited models currently in their inventory. Aerospace Daily, "Lockheed Planning to Shift to More Capable 'F-16X;' Exports Planned First."
71 Schine, Eric. "Cuts Won't Cut It Anymore."
72 Warwick, Graham. "Combat Electronics."
73 Dallas Morning News, "Most Industries expect 2nd-Quarter Improvement." The Northrup Grumman board includes several high profile figures such as former National Security Advisor Brent Scowcroft, BankAmerica chairman Richard Rosenberg, and former Rep. and now University of Texas government professor Barbara Jordan. Bernstein, James. "Caporali Joins the Board of Merged Firm."
74 CNN Moneyline, Mar. 28, 1994.
75 Kresa, Kent. "Northrop Grumman Corporation's CEO Speech to Shareholders."
76 Kresa speech.
77 Schine.
78 Kresa speech.
79 *Defense News. "Northrop Wins Contract for USAF F-15 Radars."
80 Ferrari, Paul L., Jeffrey W. Knopf and Raul L. Madrid. U.S. Arms Exports: Policies and Contractors, p. 185.
81 Ferrari et al, p. 186.
82 Gunston, Bill. World Encyclopaedia of Aircraft Manufacturers: From the Pioneers to the Present Day, pp. 52-53.
83 Porter, The Competitive..., p. 71.
84 Porter, The Competitive..., p. 65.

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- 85 Porter, The Competitive..., pp. 50-51.
86 Porter, The Competitive..., pp. 117-119.
87 See Porter, The Competitive..., p. 725.

Chapter 3:

THE POST-COLD WAR MILITARY AEROSPACE MARKET

The US military aerospace industry markets its wares overseas in an atmosphere that has been largely shaped by the vacuum left by the demise of the USSR as both a political superpower and a leading arms exporter. This chapter details some of the vast changes that have occurred in the military aerospace market since the end of the Cold War. A cognizance of the prevailing currents in today's international military aerospace market is essential to understanding not only the marketing practices of the US aerospace industry, but also the arms trade policies of both the other major characters in this study, the respective governments of the US and Saudi Arabia. Analyzed here are key components of the aerospace market, such as the aircraft purchase cycle, the newly-arising refitting market, general marketing techniques, and some of the complications of marketing aircraft produced by international consortia. Also described are the especially key roles of maintenance, training support, and offset agreements in the closing of nearly every international sale of military aircraft.

The last third of this chapter is specifically focused on France and Great Britain as the primary competitors for the Saudi military aerospace market, but also includes brief outlines of the multi-nation European Fighter Aircraft (EFA) program and the Russian and Chinese export efforts.

A GROWTH MARKET IN THE 1970S AND 1980S

Prior to the end of the Cold War, a thriving export market for military aircraft was dominated by the two superpowers, the US and the USSR, who between them more-or-less evenly shared two-thirds of

the world's arms exports.¹ Despite this superpower dominance, the number of countries exporting military aircraft and related products increased throughout the 1970s and into the 1980s, as developing nations such as Brazil, Israel, and others were added to the list of states capable of producing their own aircraft and exporting surplus production. European nations, especially Great Britain and France, were very active in promoting their arms exports overseas. Military aircraft were often their most lucrative weapons systems because of the high costs of their technical complexity and sophisticated construction. The Europeans' motives for selling these aircraft were more economically-based than the political aspirations of the US and USSR, and centered around issues of trade balances, the maintenance of an independent defense production base, and boosting employment.² In a sense, these European incentives were a foretype of the current economic emphasis that both the US and Russia now place on their respective military aerospace exports.

THE POST-COLD WAR SLIDE

As the superpower confrontation between the US and USSR receded in the late 1980s, the worldwide demand for arms showed a continued slide, dropping an estimated 62% between 1987 and 1994. The contraction of world market demand for advanced military aircraft, along with the rising costs of cutting-edge technology, effectively shut the budding producers of the developing world out of the future military aerospace market. Brazil's aerospace industry crashed, Israel cancelled its scheduled Lavi fighter program, and other developing countries like India and Taiwan who carried on with indigenous development programs became increasingly dependent on outside technical assistance.³ Developed nations, including the US, scrambled after what remaining export markets were left.

The market share left by the departure of the USSR was filled mostly by the US, and has been concentrated mostly in exports to developing countries. As the last remaining superpower, the US has become the world's leading arms exporter, now commanding up to 70% of the world arms market,⁴ of which a significant portion is aerospace and aerospace-related products. In the 1980s the US and the USSR were exporting weapons on a rough parity, but the value of the USSR's exports to the Third World was nearly double the US'.⁵ Subsequently, some of the US' recent market share increase has included a greater proportion of exports to developing countries than in the past. In recent years, the Clinton administration has even approved arms sales to several former Warsaw Pact nations.

At the present time the five nations of the United States, Russia, China, Great Britain, and France all field military aircraft prime contractors that are actively seeking export markets. Several other countries such as Turkey, Taiwan, and Japan indigenously produce their own jet fighters under licensing or co-producing agreements with foreign companies, but these aircraft are not currently available on the world market.⁶

Despite the continued decline in the number of aircraft producers, the international competition between aircraft makers has become more fierce than ever. As economic concerns such as unemployment and trade deficits have displaced political and diplomatic maneuverings as the driving force behind military aircraft exports, host governments are heavily lobbying foreign militaries to buy their country's arms.

THE PURCHASE CYCLE

Bluestone and others have well-documented the cyclical nature of commercial and military aircraft purchases. Commercial aircraft purchase cycles run about 10-12 years, and are related to the condition

and lifespan of the various aircraft inventoried in the airlines of the world. The military production/demand cycle is more related to the incidence of military conflicts, with production peaking during wartime and decreasing during demobilization. The challenge for aerospace firms is to successfully ride out the dips in these cycles and match their production with demand. Aircraft makers use a variety of methods to smooth out production schedules, to include price-slashing and the layoff of "temporary workers."

The commercial purchase cycle is currently in the middle of a worldwide down cycle, and, unfortunately for the aerospace industry, military demand is in the middle of a demobilizing period. The concurrence of the down sides of these two cycles has been especially hard on the industry in the 1990s, and has negatively effected what deals the companies have been able to close during this period. An example is Saudi Arabia's 1994 \$6 billion purchase of American airliners. Negotiations were long and hard over the timing of actual deliveries. Boeing and MDC strongly desired early delivery as the commercial down cycle was estimated to last another two years. Subsequently, Boeing reportedly offered to cut prices on its 777 model in order to facilitate an early delivery and help smooth out problems in its production run.⁷

REFITTING MARKET

As the cost of new weapons systems continues to rise, the demand for means to extend the life of existing aircraft inventory has increased, as budget-pinched countries seek to get the most out of their defense dollars. One consequence of the high price of new systems has been the formation of a strong refitting market. A rapidly growing segment of the modern aerospace involves the refitting of older airframes like the F-5 or MIG-21 with updated engines and electronics. Competition has been fierce for such contracts from

developing nations, such as the \$350 million upgrading of India's Soviet-built MIG-21s, a project which has attracted attention from the US firms Martin Marietta (now with Lockheed), Litton, Honeywell, and Northrop Grumman, as well as the Israelis, Russians and French. Although it seems ironic that US firms would be seeking to upgrade systems that were the arsenal of the enemy for so many years, industry proponents argue that possessing prime contractor status on MIG upgrades, which potentially include nations worldwide from Egypt to Peru, gives the US greater control over the technology used in the upgrade. If another country garnered these contracts they could possibly reverse engineer or divert technology that they had subcontracted from the US.⁸

MARKETING TECHNIQUES

Military aircraft are marketed by a variety of methods, to include: 1) personal visits by corporate industrialists and government officials, 2) aviation trade shows, both international events like the Paris Air Show, and domestic equipment-only trade shows hosted by military associations such as the US Air Force Association, 3) model demonstration tours, during which corporations take their products to the target country, 4) advertisements in trade magazines and journals, and 5) invitations to the target country to send teams to test-fly the aircraft.⁹

Austin has defined five categories of "export strategies" that a multi-national or global companies employ to capitalize on their respective comparative advantages. Cost strategy is centered around price considerations. Value strategy combines quality and cost for the buyer who is price-sensitive but insistent on a certain level of quality. A company employing a uniqueness strategy sells a product on the distinctive qualities that sets it apart from the competition. Value-added strategy involves the additional processing of unprocessed or

semi-processed goods before export. Finally, seasonality strategy involves marketing off-season agricultural products.¹⁰ Military aircraft are marketed through a combination of value and uniqueness strategies.

Key selling points used by military aerospace companies include: 1) the overall capability of the aircraft to include performance characteristics of the airframe and its engines, 2) the specific capabilities of the electronics components on-board the aircraft, 3) the availability of maintenance and training support from the exporting country and/or corporation, 4) political considerations-often attractive to an importing country is the possibility of an increased commitment by the exporting country to the former's national security or to provide foreign aid, 5) offset agreements, 6) price, which will necessarily factor in the cost efficiency of maintaining the aircraft throughout its expected lifespan, as well as the actual means of payment, be it cash, a favorable loan, barter or a combination of several payment mechanisms, and 7) bribery or other forms of influence peddling and corruption.

Military aircraft exporters use these selling points as part of either value or uniqueness marketing strategies. Cost strategies are not successful to the exclusion of value considerations, or inexpensive and unsophisticated Chinese-made F-7s fighters would currently dominate the world market. A aircraft's price, although an important factor, takes a secondary role to overall value of the aircraft as exhibited by its performance capabilities and the follow-on support and investment provided by the host company and government. Thus, in 1993 the Israeli Air Force chose to purchase approximately 20 McDonnell Douglas F-15Es for \$100 million apiece, more than twice the per unit cost of the competing Lockheed F-16ES, because of the superior quality of both the F-15E's airframe and electronics systems.¹¹ In this case, the uniqueness strategy came into play in the political considerations selling point, as the US foreign aid paying for

the aircraft effectively narrowed the field to American fighter makers. At that juncture, McDonnell Douglas and Lockheed competed on the value of their respective products, with Lockheed unsuccessfully promoting a better price for a slightly less-capable product.

The employment of the political factor as the foundation of a uniqueness marketing strategy is not only used by the US. Some of China's and Russia's arms sales have only come as the result of their willingness to sell weaponry to nations shunned by the West as too dangerous to be sold advanced weaponry, such as Iran and North Korea.

The selling points of training and maintenance support and offset agreements mentioned above deserve further explanation, as they are crucial factors to successful aircraft sales in the fiercely competitive environment of today's arms market. The following expands on both of these points, and also includes a section on corrupt practices in the aerospace market.

MAINTENANCE AND TRAINING SUPPORT

The maintenance and training support specifications are a vital component of an international arms contract, and are often the core of a military-to-military relationship between the two countries. Developing countries are dependent on the exporting country to not only provide them advanced weaponry, but also to help create the infrastructure necessary to successfully operate the system. This requires extensive training of personnel; not only do pilots need to be instructed how to fly the aircraft, but maintenance personnel must be trained how to repair and maintain the system, and senior officers need to learn the tactics that will employ their new weapon to its best advantage. The training of personnel is an extensive commitment. Often, foreign military members designated to work with the new system must first learn enough English or French to read and

understand reasonably sophisticated operating and maintenance manuals, a considerable endeavor in itself. After overcoming the language barrier, the airmen will spend months in military schools learning the intricacies of a sophisticated aircraft, or in the case of pilots, over a year in flight school honing their flying skills. The training cycle will either involve foreign personnel traveling to the US or Europe for their training, or a military or contractor training mission traveling to the recipient country. The end result of all this training is foreign personnel not only inculcated with technical knowledge of their new aircraft, but also with host military doctrine and strategy, as well as the host language. An important side effect to the entire process is two militaries operating much more compatibly than before the arms transfer.

Parallel to the training effort is the supply agreement which guarantees spare parts, armaments, and the construction of support facilities. Many aircraft require the construction of maintenance and storage buildings constructed specifically for the new system and its munitions. The construction corollaries to an arms sales are sometimes multi-million dollar arrangements involving the construction of vast complexes of expensive hangars and maintenance structures.

A crucially important component to a new aircraft's future effectiveness in battle is the availability of spare parts. The example of Iran's largely ineffective air force during the Iran-Iraq War is just one of many in which a country's aircraft were idled during a time of conflict because the parts necessary for the plane to operate were unavailable. For this reason, spare parts provisions are normally specifically written into most aircraft contracts.

OFFSET AGREEMENTS

The offset specifications of an international aircraft sales agreement are sometimes the most important factor in closing a sale, in some cases even outshining such traditional sales points as price or quality. The dreary worldwide economic atmosphere is one in which both developed and developing countries are desperately trying to increase their domestic industrial base. Due to the buyer's market in weapons exports, importing countries are often able to extract generous offset provisions from the exporting country.

Offset agreements come in quite a variety of forms, ranging from direct investments such as technology licensing or joint investments under co-production agreements, to indirect forms involving exchange of dissimilar goods, barter, or access granted to the exporting country's markets. The percentage of the arms contract required to be "offset" vary by country. Saudi Arabia currently requires that 30% of the arms transaction total worth be reinvested back in the kingdom. Neighboring United Arab Emirates (UAE), however, has taken more strict view, requiring that their offset requirements can not be simply accounted for by measuring reinvestment. In an effort to insure that new offset companies are not just inefficient dumping grounds for Western companies trying to satisfy their offset obligations, the UAE measures the profits of offset companies. If the company is not profitable, the investment will not count towards fulfilling UAE's offset requirements.¹²

Offset agreements carry definite risks to the exporting countries. The technology transferred in a licensing or co-production agreement can eventually someday be used against you in war if political alliances shift, or if an importer utilizes their newly-acquired technology to develop a competing product. In addition, an unwise offset agreement can effectively gut the economic worth of exports to the exporting country. Arms control promoters are especially quick to

point this out, arguing that the economic worth of many arms agreements is highly overrated. According to Horvitz, in 1987 US arms industries paid out \$3 billion in offset agreements but only recorded an equal \$3 billion in actual sales, effectively negating their economic export value for the year. Industry officials counter with the claim that they must purposely exaggerate the worth of their offset investments to close sales and make money.¹³

The US General Accounting Office (GAO) has been recently questioning the aerospace industry's acquiescence to severe offset requirements from such countries as Israel, Egypt, Greece, and Turkey, to which the US gives billions of dollars of foreign aid earmarked for military spending. Aerospace companies marketing aircraft in these countries subcontract sometimes well over half the worth of their sale back into the recipient country, costing taxpayers twice, first through foreign aid and again through lost US jobs and revenues.¹⁴

CORRUPTION

Even more disturbing than offset giveaways has been the corruption that has been present in some military aerospace sales. Cash "commissions" to unscrupulous government officials could be simply classified as an unconventional employment of the Austin's uniqueness marketing strategy, if one assumed his company is the only one paying off government officials. But as the following section will demonstrate, that may not always be a safe assumption. During the 1970s US government investigators discovered that rampant bribing of local power figures by arms corporations in exchange for lucrative contracts was a persistent pattern of misbehavior in the military aerospace trade, especially in the Middle East, to include Saudi Arabia. Also uncovered was a practice of secretly funding American political candidates in hopes of obtaining industry

support.¹⁵ Aerospace companies who admitted to wrongdoing during this period after pressure from the Subcommittee on Multinational Corporations of the Senate Foreign Relations Committee included Northrop, Lockheed, Grumman, Raytheon, and McDonnell-Douglas. The DoD estimated these firms and others paid out over \$200 million in bribes and other "incentives" to potential customers from 1971-1975.¹⁶ In response, the US Congress wrote a section (the Corrupt Practices Act) into the Arms Export Control Act which rather vaguely prohibits "inappropriate" payoffs to foreign government officials. The effect has seem to have been an elimination of most of these practices in the last fifteen years. Furthermore, many of the developing nations importing American weapons have instituted stricter measures of their own designed to curb government officials abusing their power for financial gain.

Despite these safeguards, it must be remembered that military transactions are by their nature very secretive, and offer maneuvering room for shady dealing. In fact, two recent cases may indicate a small resurgence of corporate misbehavior. Although the recorded instances of this kind of business has declined since the 1970s, the recent diversion of US aid funds by Israeli military officers has highlighted the ever-present possibility of corruption seeping into the arms transfer system. In 1992 executives from jet engine manufacturer General Electric (GE) pleaded guilty to conspiring with Israeli general Rami Dotan and his cohorts to steal up to \$70 million of US aid money by conspiring with Dotan in diverting GE subcontracting funds to shadow subcontractors. Claiming the incident was the largely the doings of a single employee, GE agreed to pay a \$69 million fine.¹⁷

Pratt & Whitney employees were also indicted for participation with Dotan for a five-year period from 1986-1991, but claimed that they were unknowingly duped into his schemes.¹⁸ They were found innocent of intentional wrongdoing, but the GAO scolded that the

company should have been aware of the diversion of funds.¹⁹ More recently, two Lockheed executives were indicted in January of 1994 for paying millions of dollars of "commissions" to an Egyptian parliament member in connection with the \$79 million sale of three C-130 Hercules transports.²⁰

The British have also been accused by the French and some of the British press of paying enormous commissions to arms middlemen and politicians in the Middle East. The Washington Post cited these overcommissions as one possible reason a proposed Tornado deal with Jordan fell through in 1989, and why the British successfully sold Saudi Arabia the Tornado over the French Dassault Mirage. The accusations were cited by the British government as cheap shots by the losers in a fair competition.²¹

Not just corruption but all of the marketing techniques and selling points described above are used by the major aircraft-exporting companies of the world, and are indicative of the comprehensiveness of internationalization in the world military aerospace market.

INTERNATIONALIZATION AND MARKETING

The internationalization of the aerospace industry has had a profound effect on the marketing of aircraft as well as their production. Just as scarcely any complex, large product manufactured from thousands of individual components can rarely be said to be a product solely of a single, domestic origin, nor are any large aerospace companies content to only market their products in a single domestic market. The inter-European conglomerates such as Panavia formed specifically for international cooperation on large military programs demonstrate internationalization to the ultimate degree, but many do not realize that American aircraft makers buy a great deal of their individual components on the international market, as does China, and now even Russia.

As the sale of military aircraft is largely a political as well as economic phenomenon, the complexity of an international arms sale increases as production partners must coordinate their respective foreign policies to permit, encourage, or avoid arms transfers. The political power over arms sales has been the primary factor inhibiting further internationalization in the aerospace industry. In one such case, the British attempt in 1989 to sell Tornados to Jordan eventually fell through because the government of the German co-producers refused to underwrite their share of credits.²² In another example, the US government ensured that licensing and coproduction agreements with Japan and Taiwan prohibited any subsequent exports of the Japanese FSX or Taiwanese IDF fighters to other countries.

Modern weaponry, especially missiles or long-range aircraft capable of offensive operations, is too closely tied to the power of nation-states to be completely turned over to the influence of the global marketplace. In the case of the US, the desire to avoid international collaboration has cost American companies several opportunities to participate in several major international aerospace development programs.²³

The two European countries of France and Great Britain have in particular strived heroically against internationalist pressures to maintain indigenous aircraft industries for prestige, employment, and national security reasons. The following will focus on these two other competitors for the Saudi military aerospace market, as well as briefly discuss joint European aerospace projects, and the current aerospace export endeavors of Russia and China.

FRANCE

The Republic of France has always strived to maintain a domestic capability to manufacture all of its weaponry. In modern times their production capability has ranged from tactical weapons

such as tanks and aircraft, to strategic nuclear vehicles such as France's nuclear-tipped ballistic missile force. In his book Making and Marketing Arms, Edward Kolodziej intimately and thoroughly details the French military industrial complex and its marketing efforts overseas, demonstrating that the French impulse to maintain a healthy defense industry is deeply imbedded in the very psyche of the French government, never wavering as a consistent tenet of French domestic and foreign policy through every post-World War II administration.²⁴ French ambassadors and military attaches around the world are expected to support and promote the sale of French arms abroad, and public funds are available for use in developing weaponry for export.²⁵

As the cost of modern weaponry increased over the 1960s and 1970s, France's weapons exports became an integral resource to help finance and support the size of military industrial complex France felt necessary to maintain an independent measure of national security. To this end, the French government has aggressively marketed its armaments for decades now, exporting weapons to over 100 countries, to include most of the nations of the Middle East.²⁶ Unlike the US or Great Britain, who have established customers in Western European nations, France sells the vast majority of its weapons to developing nations. Between 1974 and 1982, 90% of orders for French armaments came from outside Europe, mostly from the Third World.²⁷ A common sales theme of the French arms marketers until recent times has been that France is the best weapons source for non-aligned countries who wished to avoid obtaining their defense systems from either superpower.

France has typically exercised less export controls on weaponry than either Great Britain or the US. One result of this loose policy was the spectacle of allied forces in Desert Storm, including the French Air Force, fighting against the French-built Iraqi Mirage F1s, a quite

capable third-generation fighter with substantial air-to-air and air-to-surface capabilities.

France exploits weapons deals for political as well as economic reasons; a major goal has been to strengthen French ties with oil-producing Arab states such as Saudi Arabia and Libya.

Dassault Aviation. The primary airframe maker in France today is the Dassault Aviation company. The French government owns 46% of Dassault Aviation stock, and possesses majority voting rights.²⁸ Dassault has produced many well-known aircraft over the years, including the Mystere, Super Mystere B2, Mirage F1, Mirage IV bomber, Etendard, Super Etendard, and a variety of business jets and trainers.

Dassault relies heavily on exports for its revenues, even to the extent that the needs of the French Air Force have sometimes taken a back seat to the demand of the export market. During the 1970s and into the mid-1980s, an average of 60% of the company's annual production was for foreign militaries.²⁹ The Mirage III/5/50, produced during the 1960s and 1970s with a 1422-count production run,³⁰ was one the most common export fighters of the period. The current fighter in production is the Mirage 2000, which has not sold on the international market quite as well as was hoped.³¹ The mediocre exports sales of the 2000 has not prevented the Dassault from remaining profitable. Even during the present market downturn the company managed to turn a \$39 million profit in 1993 on \$1.9 billion in sales.³²

Dassault's latest development and production effort is the new Rafale fighter. Initial deliveries of the Rafale were recently pushed back to mid-1998. The French military chose to delay delivery rather than cut production, as they maneuvered to stay within the confines of their shrinking defense budget.³³ Dassault is counting on export sales to help make the program financially sound.

The largest defense firm in France in the Thomson group, which ranked ninth in total worldwide defense sales in 1993.³⁴ Although Thomson does not manufacture aircraft frames, the company along with Dassault Electronique are the most important makers of the electronics systems so central to the effectiveness of the Dassault aircraft currently in production. The primary aircraft engine manufacturer is Societe Nationale Industrielle Aerospatiale (SNCEMA), which is the French government's privatization list.³⁵ The military division of the Matra-Hachette corporation is famous worldwide for its air-to-air missiles and rockets.

French Co-production. The French declined getting involved with other West European nations in the development and future production of the EFA (European Fighter Aircraft) program, preferring to develop the Rafale independently. The Breguet company, which Dassault bought in 1971, has co-produced both the Jaguar and the Alpha jet with British companies in 50/50 deals,³⁶ but there are not any current plans for French-European production. However, this may soon change as the French are currently reaching their technological limits. In recent years they have been forced to import some of the more advanced electronic components of their latest aircraft, as it was more economically feasible to simply purchase already mature technology rather than go the expensive route of trying to develop it indigenously.

GREAT BRITAIN

The British aerospace industry is of substantive size, earning revenues of \$15.3 billion in 1993. \$8.1 billion of this total was military sales, down from a high of \$10.3 billion in 1990. The sales percentage breakdown by category in 1993 was airframes 39%, equipment 35%, engines 24%, and space 2%.³⁷ Industry products are heavily promoted

abroad by the British government, and the industry is considered one of the most important manufacturing industries in the country.

British Aerospace (BAe) is the only British firm which manufactures high performance military aircraft. BAe is the largest non-American defense contractor in the world, ranking fifth in total worldwide defense sales in 1993, according to the Defense News.³⁸ Like most large aerospace companies, BAe descended from the merger of several smaller aviation companies. In 1977 the British government nationalized British Aircraft Corporation, Hawker Siddeley Aviation, and several other aviation firms, uniting them in a single corporation named British Aerospace. In 1981, 48.5% of the ownership of the corporation was offered to private shareholders as part of Prime Minister Thatcher's privatization program. In 1985 Her Majesty's government sold off the rest of its shares.³⁹ The move reportedly left the company leaner, more flexible and better able to survive in the today's tough environment, as it released the company from political hindrances such as mandated overstaffing of employment rolls.⁴⁰

British government support of BAe has been consistent throughout the 1980s and 1990s, as British officials aggressively market BAe wares to developing nations, especially in the Middle East. The exporting of high-tech weaponry is viewed as a crucial pillar to maintaining a domestic weapons production capability, and as a provider of manufacturing jobs for the country.

BAe has coped with the recent defense downturn by cutting costs, laying off 22% (35,000) of its work force in two years, and concentrating on its defense and aerospace businesses by selling off its automobile, construction, and even corporate jet divisions. The company lost \$353 million in 1993, but its defense division made \$514 million on almost \$6 billion in sales.⁴¹

A favorite strategy of BAe is to participate in joint ventures with other European firms. The company currently is a major partner in the Panavia Tornado program (with 42.5% ownership), and will have a 33% stake in the coming Eurofighter. Germany owns a equal share in both programs, and Italy has a 21% share of the Eurofighter, and 15% of the Tornado. Spain's CASA owns 15% of the Eurofighter. BAe possesses sole responsibility for the production of the T-45 Goshawk, the Harrier and Sea Harrier, all the various versions of the Hawk trainers, and upgrade programs for the Buccaneer and other aircraft. The BAe commercial aircraft division has a 20% share in Europe's Airbus consortium, and produces a number of small corporate and transport aircraft.⁴²

"Orders abroad mean jobs at home," says British Prime Minister John Major.⁴³ Although Germany and Italy had a significant share of the Tornado program, Great Britain has taken the lead role in promoting the export of the aircraft to other countries. Great Britain has strongly pursued weapons exports as a revenue supporter for the nation. The gigantic Al-Yamamah sale of Tornados to Saudi Arabia was contracted with Great Britain only, Germany and Italy did not sign the agreement, although they benefitted greatly from it.

Rolls-Royce is the primary engine-maker for BAe aircraft. On the latest order of Saudi Tornados, Rolls-Royce, in partnership with Germany's DASA and Italy's FiatAvio, will supply around 100 RB-199 engines for \$750 million dollars,⁴⁴ with delivery starting in 1996. Rolls-Royce chose to ride out the current turbulence in the aerospace market by cutting costs and maintaining 40% of its business in industrial power.⁴⁵ The largest British defense electronics firm in GEC-Marconi, which is part of General Electric Company (GEC) of Britain.⁴⁶

THE EUROPEAN FIGHTER AIRCRAFT

Great Britain's hopes for making and marketing aircraft in the future are united with those of its West European neighbors Germany, Italy, and Spain in the success of the European Fighter Aircraft (EFA). The EFA program is targeted to supply the next generation of air-to-air and ground-attack fighters for the air forces of Western Europe and export customers worldwide.

Doz has stated that although forming international consortia is a viable means of quickly acquiring a competitive position in a global market,

the sharing of strategic control over competitive actions by several partners usually results in tensions as soon as the external technological and market conditions evolve or the relative strategic importance of the joint activities to the various partners changes."⁴⁷

The EFA project has demonstrated the sometimes seemingly intransigent difficulties of managing a joint defense production program of the size necessary to produce a modern military aircraft. The costs and problems of this program has multiplied exponentially. In 1990, the Europeans estimated the EFA's development costs would cost \$5 billion, now estimates range up to \$47 billion. This cost inflation, as well as disagreements over design and production control, nearly doomed the consortium when Germany pulled out of the project in 1992. Germany agreed to return to the project only when assured that the EFA would be redesigned to specifically incorporate low-cost production.⁴⁸ The problems of the EFA program may have been fatal as far as anticipating a healthy share of exports for the aircraft; when Eurofighters finally start rolling off the production line somewhere around 2000, it will probably be inferior to the technology of American aircraft in production today, much less a serious

competitor to the stealthy aircraft of the future, although it may cost less.

In another cooperative project, seven European nations, France, Germany, Spain, Portugal, Italy, Belgium, and Turkey, along with Great Britain's BAe (sans government support) are collaborating on the Future Large Aircraft (FLA) military transport aircraft. This program is in the early stages of development, and will not be produced for at least five years.⁴⁹ The FLA program has experienced international coordination difficulties of its own, resulting in the British government instead of the Germans bailing out of the project in mid-stream.⁵⁰

RUSSIA AND CHINA

China, and to a lesser extent Russia, market their aircraft more on lower cost than technological capability, as their aircraft are not currently compatible with the European and American offerings. In pure performance characteristics, Russian fighters such as the Sukhoi SU-27 Flanker and the Mikoyan MIG-29 Fulcrum and MIG-31 Foxhound are on a par with Western aircraft,⁵¹ but in electronic capabilities the severe shrinkage of the Russian military technological base has helped give the Western companies a small edge in this continually and rapidly advancing field. Furthermore, many developing countries are hesitant to buy Russian aircraft because of the Yeltsin regime's continuing internal instability, which could possibly hinder or endanger the necessary long-term technological support so necessary in a complex transaction such as a major purchase of advanced military aircraft.

Despite these shortcomings, Russia is currently trying hard to sell more of its military equipment abroad. Aside from space launches, military hardware just may be the only manufactured goods they can offer internationally on a competitive level. They have

adapted to capitalist techniques of selling on the world market, promising previously unoffered benefits such as the construction of maintenance facilities, training, and spare parts.⁵²

Chinese aircraft, on the other hand, are generally low-cost copies of proven Soviet models, and are heavily dependent on the licensing of Western technology for their electronics systems. Their export customers are more interested in the low price of Chinese systems, or simply their availability, if the host country happens to be on the weapons export blacklist of Western governments.

- 1 U.N. Department for Disarmament Affairs. Study on Conventional Disarmament, p. 21.
- 2 Klare, Michael T. American Arms Supermarket, pp. 222-223. Snider, Lewis W. "Do Arms Exports Contribute to Savings in Defense Spending? A Cross-Sectional Pooled Time Series Analysis," in Marketing Security Assistance: New Perspectives on Arms Sales, p. 42.
- 3 US Office of Technology Assessment, "Global Arms Trade," quoted by Leslie Alan Horvitz, "The World Gorges at the Arms Cornucopia."
- 4 Horvitz.
- 5 In 1986 and 1987 the Soviet Union's share of weapons exports was 45.8% and 48.5% respectively, while the US garnered a 12.8% share in 1986 and 18.5% in 1987. The major West European nations increased their share of exports during the same period from 10.7% to 18.6%. Grimmett, Richard F. Trends in Conventional Arms Transfers to the Third World, pp. 1-2.
- 6 Although some Turkish-built F-16s have been sold to Egypt, per approval of the US.
- 7 Acohidio, Byron. "Analysis--What Did Saudi Deal Cost Boeing? --Did Aerospace Giant Offer Big Discounts, Exchange Jet Models to Land Offers?"
- 8 Mintz, John. "U.S., Contractors in Dogfight Over MiG Modernization."
- 9 Klare, pp. 65-66.
- 10 Austin, James E. Managing in Developing Countries: Strategic Analysis and Operating Techniques, pp. 305-306. Other theorists such as Porter have condensed all corporate competitive strategies to simply cost leadership or differentiation.
- 11 Pinkas, Alon. "Senior Lockheed officials to Present F-16ES Proposal to Air Force."
- 12 Interview with Mr. John Robinson, offset analyst for Northrop Grumman.
- 13 Horvitz. European buyers of military aircraft such as Belgium and Denmark have been especially adept at exploiting the competition between Great Britain, France, and the US to extract offset agreements which sometime approach the total worth of the contract.

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- 14 Mintz, John "GAO Report Critical of Military 'Offsets'; Agency Urges End to
Contract Quid Pro Quo."
- 15 Klare, p. 64.
- 16 Klare, pp. 64-65.
- 17 Remez, Michael. "Pratt Aided Overpricing Scheme, Report Says." Dotan is
currently serving a 15-year sentence in an Israeli prison.
- 18 Mintz, "GAO Details..."
- 19 Remez.
- 20 Bloomberg Business News. "Company News: Lockheed is Indicted on Fee in
Egypt Deal."
- 21 Randal, Jonathan C. "British Weapons Sales Spur Controversy."
- 22 Randal. Another explanation for the failure of this deal besides the formerly
cited accusations of corruption.
- 23 Hayward, p. 16.
- 24 Kolodziej, Edward A. Making and Marketing Arms: The French Experience
and Its Implications for the International System, p. 1.
- 25 Kolodziej, p. 269.
- 26 Kolodziej, p. 1.
- 27 Kolodziej, p. 176.
- 28 Gunston, p. 91. The government was planning to integrate, but not merge,
Dassault with the French helicopter company Aerospatiale (also state-owned) in
an effort to create a truly massive French aerospace enterprise, but the deal fell
through. Sarkar.
- 29 Kolodziej, p.206.
- 30 Gunston, p. 91.
- 31 Kolodziej, p. 170.
- 32 Sparaco, Pierre, and Carole A. Shifron. "Europe Faces Turmoil as
Privatization Stalls."
- 33 Warwick, "Combat..."
- 34 Flannery, "Top Guns..."
- 35 Sparaco and Shifron.
- 36 Gunston, p. 91.
- 37 Sparaco and Shifron.
- 38 Cited by Flannery, "Top Guns..."
- 39 Gunston, p. 59.
- 40 Sparaco and Shifron. Drucker has argued that Britain's traditional emphasis
on blue-collar job preservation over international competitiveness has been a
classic example of misdirected macroeconomic policy resulting in massive
unemployment. Drucker, p. 8.
- 41 Sparaco and Shifron.
- 42 Gunston, p. 60.

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- 43 quoted by Schmidt, William E. "British to Sell Saudis Warplanes and Supplies Worth \$7.5 Billion."
- 44 Meed Middle East Business Weekly. "Al-Yamamah Agreement Raises UK Spirits; Sale of 48 Tornado to Saudi Arabia," p. 29.
Sparaco and Shifron.
- 46 GEC is not connected with General Electric of the US.
- 47 Doz, p. 22.
- 48 Kapstein, Ethan B. "America's Arms-Trade Monopoly; Lagging Sales Will Starve Lesser Suppliers."
- 49 Warwick, "Combat..."
- 50 McVitie, Doug. "FLA Flap Threatens to Isolate British."
- 51 Sukhoi and Mikoyan are design bureaus rather than production companies in the Western sense. If any of their respective designs are accepted by the Soviet military, they are subsequently approved for production by the Russian military industrial complex.
- 52 Horvitz.

Chapter 4:

THE US GOVERNMENT AS MARKET OVERSEER

The United States government is the single most dominant presence in the military aerospace business, acting not only as the industry's primary customer, but also as a promoter, subsidizer, and regulator. As the only instrument responsible for overseas sales, the government also manipulates arms sales to meet foreign policy goals, all the while maintaining at least a modicum of interest in conventional arms control.

Austin has described the government of a typical developing nation as a "mega-force" which impacts every industry dynamic in that country through the exercise of comprehensive regulatory power and resource control.¹ In the same sense, the US government is a mega-force in the US military aerospace industry due to its extensive interaction with the industry at every level of its business. The choices the US government makes regarding aerospace, whether it be an internal purchasing decision, an attempt to encourage or discourage exports to a particular country, or the initiation of a new field of research, have the power, as Austin states, to "fundamentally determine the structure of industries, the nature of competition, and relative competitive advantage among firms."²

Yet the US government is not simply a single, monolithic force representing a few basic interests. Different agencies of the government hold different agendas, resulting sometimes in ideological conflict between two branches of government, or occasionally even an active working at cross-purposes. Described below are the roles of the US government mentioned above, all of which combine, contrast, and conflict to shape the complex and interdependent relationship between the US government and the US military aerospace industry.

THE US GOVERNMENT AS CUSTOMER

The US DoD has always been the primary market for US military aircraft. Nearly all US military aircraft are designed and manufactured in direct response to identified DoD needs. The export market, although important, has always exercised a supplemental function to the primary goal of providing US military forces with the best and most advanced fighting aircraft in the world.³ The Northrop F-20 was one of only a very few US-made military aircraft designed specifically for export. As the eventual failure of the F-20 demonstrated, to design and manufacture an aircraft sufficiently advanced to sell on the world market before it has proved its worth on duty with the US armed forces may pose an unacceptably high risk to the manufacturer.

The weapons procurement process of the US Department of Defense (DoD) is a highly politicized procedure in which Congressional members, industry executives, and service chiefs fiercely lobby for favored weapons systems in an often inefficient and discontinuous process. Resultant decisions are sometimes detrimental to the military's needs and/or the industry's comparative production advantages. US purchases of weaponry have been on a continuous downward slide since the mid-1980s. It is estimated the total defense budget will shrink a total of 50% between 1986-1997,⁴ and the result has been a severe contraction in the size of the defense industrial base. Aerospace industry leaders strongly promote the idea of letting competition and free enterprise handle the downsizing of the industry as well as govern the procurement process. They feel that an unproductive burden of procurement regulations and heavy-handed anti-trust oversight is hindering the continued rationalization of the industry.⁵ Despite procurement inefficiencies, the US government's insatiable appetite for technological advancement from the aerospace

industry has funded enough effective product innovations to give the US aerospace industry a substantial lead over its competitors.

THE US GOVERNMENT AS PROMOTER

The Pentagon has often been an active government promoter of military sales abroad. The US DoD, as the primary consumer of US military manufactures, has a direct interest in the maintenance of a healthy military industrial base. The Pentagon acts on this interest by paying special attention to its role as an arms export facilitator. Aircraft makers energetically promote their product directly to foreign governments, but they must rely on the government to legally contract the delivery of warplanes to foreign countries. Only the US government signs military aircraft sales contracts to foreign customers. After the DoD completes this paperwork mission, it moves into the role of insuring that these customers are delivered their weapons on-time and with the proper training and support. The DoD in this role acts more as an interested participant in the process rather than a neutral agent carrying out a mission as ordered by the administration. Military personnel assigned to train foreign personnel and oversee rational and orderly transfer of these weapons take great care to insure that American-made systems are used and maintained properly; their view is that the reputation of the product, and by association, US military capabilities in general, are on the line when a foreign military employs an American system.⁶

In addition to the recognizance of the beneficial effect of exports on the US military industrial base, the Pentagon maintains that arms exports can become a limited form of force multiplier. A central component of successfully fighting and winning an overseas military conflict is to forward position weapons, so that in the time of conflict no valuable time and energy will be wasted transporting the equipment to the battlefield. Many developing nations would consider

it an insult if the US asked them to give up a piece of their sovereign territory for the storage of American weapons. However, the Pentagon fully realizes that if a country imports and employs American weaponry, there is automatically a large degree of interoperability between American and foreign forces, which lessens some of the need to forward position American-owned weapons.

One of the specific training objectives of US military missions supporting arms sales, although not specified in any Letter of Offer and Acceptance (LOA) is to train and equip foreign military personnel to interoperate with US forces in the event of certain types of contingencies.⁷ The other means of accomplishing this goal are joint military exercises and training foreign military personnel in the US, both expensive endeavors. When a foreign country pays the US to train its personnel as part of an arms deal commitment, the interoperability aspect of the training amounts to a real cost-saver for the Pentagon. If US military forces are ever called upon to fight in alliance with the recipient country, not only are these recipient countries now armed with American weapons, but they are also trained by US military missions to use them in strategies and methods usually identical to those taught to American forces. Such similarity in training greatly facilitates joint operations.⁸

The DoD functions described above constitute more of an indirect promotion of US military aerospace exports. In recent years the practice of sending foreign emissaries to the target country to directly lobby for purchase of American aircraft has become commonplace. The same has certainly been a practice of European countries such as France and Great Britain for years now. In fact, many US aerospace leaders are calling for the current administration to do more in promoting US products overseas. The aggressive salesmanship by European government officials has become, in their view, an unfair trade advantage.

A new way in which the US government may soon be promoting American weaponry abroad could result from a recent Pentagon plan to sell used American equipment to foreign countries, and use the acquired funds to buy new equipment. The initial stage of the program would involve the sale of 400 USAF F-16 fighters for a planned \$4.8 billion, to be followed by later sales of C-130 cargo planes and KC-135 tankers.⁹ After these sales, the USAF would then have the funds to turn around and buy an undetermined number of new Lockheed F-16s for a flat price of \$20 million apiece.¹⁰ The plan has the support of some aerospace industry officials, as it would help fund purchases of the new aircraft, provide refitting business as the USAF aircraft would be upgraded before export, and generally promote the use of US equipment abroad.¹¹ Although the US government has given away used equipment to developing countries as part of security assistance programs, this would be the first time the government would be offering used weaponry on the open market.¹²

THE US GOVERNMENT AS SUBSIDIZER

Besides acting as the lead customer and international promoter of US aerospace industry output, the US government, because of its vested interest in maintaining a healthy defense industrial base, directly and indirectly subsidizes the military aerospace industry in a variety of ways. These include sharing R&D risk, providing production facilities for several aerospace firms, financing some purchases, and in the case of Egypt and Israel, actually paying for their weapons imports with billions of dollars of foreign aid earmarked for military improvement.

Some economic analysts argue that the entire FMS program is in effect government-subsidized employment of American workers, and that the true cost of exported aircraft is distorted by indirect government subsidization of defense industry. The British and other

European nations view their weapons exports and the exports of other countries as largely an employment issue, and are also accused of heavily subsidizing their defense enterprises.¹³ The US Arms Export Control Act of 1976 prohibits the US government from profiting from arms sales, and the salaries of all the many personnel working in the extensive DoD arms export training and support bureaucracies are fully budgeted and paid for by arms sales contracts. However, it remains true these bureaucrat's jobs, as well as many aerospace industry jobs, would not exist without government support of the export system, so in that sense the US government is a job provider, although to what degree it is at taxpayer expense is unclear.

One of the hottest points of contention between the military aerospace industry and the Pentagon is the funding of the extremely expensive process of performing the R&D necessary to create cutting-edge military aircraft. The military aerospace industry operates in a unique production environment in which the DoD is the only primary customer. Industry officials thus believe the government-industry relationship has to be more of a partnership when risks are higher than faced by a "normal" business. Of course, one must question if the DoD could ever spend enough to satisfy industry. The Pentagon does spend billions on R&D, awarding \$22.29 billion in Research, Development, Test and Evaluation (RDT&E) contracts in 1993 alone. Significantly, in that year 18 of the top 20 R&D contractors were either aerospace companies or companies with extensive aerospace divisions.¹⁴

A new twist in this problem may develop if the aerospace industry shrinks beyond its current number of four prime contractors. If the number drops to one or two, true competition may disappear, and the government may have to step in and take more of a directive role, something which neither party desires at this point. The government is currently exercising its anti-trust powers to monitor the defense drawdown endgame. The Lockheed-Martin Marietta

merger went under severe scrutiny before it was finally approved. Such cases have prompted some industry figures such as Hughes Aircraft Company CEO C. Michael Armstrong believe that further needed rationalization is already being hindered by anti-trust measures.¹⁵ However, governmental oversight is crucial to the maintenance of a healthy level of competition and guard against overspeculation. Some trade analysts such as Michael Porter believe American industry as a whole is too quick to merge and too slow to invest in new plants and technology.¹⁶ An over-focus on short-term profits by the arms industry that results in an excessive number of mergers will not meet the US government's interest in a diverse and healthy defense industrial base.

Another controversy between the military aerospace industry and the DoD is the DoD's operation of aircraft maintenance depots. These depots operate as a sort of anti-subsidy, as they are in direct competition with private aerospace industries which operate similar facilities. With the drop in available procurement funds, aerospace companies are coveting a greater share of the maintenance business, which amounts to \$13 billion annually in regular maintenance, and a further \$9 billion annually in model upgrades. In a political move to save home district jobs, Congress has dictated that 60% of this work will remain in the hands of the government. Industry proponents have been crying foul, claiming unfair competition as the government facilities are subsidized with tax dollars.¹⁷

Another way the US government has not subsidized military aerospace exports is through utilizing the government-owned Import-Export Bank to finance arms exports. Various agencies in the Pentagon have proposed reversing that policy by including arms deals under the bank's purview and support, or establishing a separate fund for the specific purpose of financing arms exports. France, Great Britain, Canada and Germany all guarantee both defense and commercial loans.¹⁸

THE US GOVERNMENT AS REGULATOR

The US government has regulated all US defense-related exports since the Neutrality Act of 1935, which empowered the State Department with the authority to license arms exports. The Mutual Security Act of 1954 and the Arms Export Control Act (AECA) of 1976 later elaborated on the precise requirements a potential arms exporter has to meet.¹⁹ Currently, the primary law regulating US arms exports is still the AECA. The rules for export under this law are contained in The International Traffic in Arms Regulations (ITAR). Under the AECA, each specific arms export has to be approved by a number of governmental agencies, to include final veto authority of any sale which can be wielded by the Congress within 60 days of notification by the Pentagon.²⁰

The AECA provides arms companies with two primary outlets for the sales of weapons outside the US, the Commercial Sales program and the Foreign Military Sales program.

The Commercial Sales program is run by the State Department's Office of Munitions Control. The government primarily utilizes its Commercial Sales office for the oversight of small arms and police/paramilitary gear exports,²¹ although sometimes exports of non-lethal military aircraft such as military transports are approved under this program.

The Foreign Military Sales (FMS) program oversees all government-to-government arms transactions. Foreign customers actually pay into a FMS fund for their weapons, and in turn the government pays the arms maker out of the fund after delivery of the system, and after charging a 3% surcharge.²² Most US arms exports, including nearly all if not all aerospace exports to Saudi Arabia, are handled through FMS. The program even handles military aid programs. During the 1950s and 1960s, most US arms were exported through the Military Assistance Program (MAP), which was basically

a US taxpayer-funded giveaway of older weapons to countries the US considered important to US interests, primarily in the cause of containing Communism. Now, recipient countries of US largesse such as Israel and Egypt are allotted foreign aid funds which are subsequently used through the FMS program to buy weapons. All weapons systems handled under the FMS program must be in the US armed forces inventory.

If a US firm decides it wishes to export military aircraft through the FMS program, it will have to deal with a number of US governmental agencies, including the Pentagon's Defense Security Assistance Agency (DSAA) and Office of the Assistant Secretary of Defense for International Security Affairs (ISA), and the Department of State's Office of Assistance and Sales (SAS).²³ The US government is vested with authority to initiate, negotiate, and close arms transactions. Importantly, if a private company wants to sell aircraft overseas, it must convince the customer government to formally request the Pentagon to sell them that company's particular product. Otherwise, the country may come to the Pentagon with simply a list of defensive requirements, upon which the Pentagon can make its own suggestion on which system would best fill the customer's need. The DoD may be more interested in ensuring that the customer's new system is compatible and interoperable with equipment in the US military's inventory rather than making a particular defense company profitable.

The DoD Arms Export Bureaucracy. Although the AECA designates the US Secretary of State as the formal authority over foreign military sales, the DoD has been delegated day-to-day supervision of the program, since the FMS program deals with exclusively military equipment.²⁴ The DoD is by far the most active administration department in the overseas sale of American weaponry. As the GAO thoroughly states,

The Defense Department, by virtue of its orientation, mission, expertise, relationships with foreign military, and delegated responsibilities, remains the most active and involved Government entity in foreign military sales. Defense is involved in detailed force planning; in considerations of pricing, availability, releasability, and absorbability [of military gear]; and training, delivery, payment, and continued support of arms sales. Defense thus has tremendous influence on ultimate arms transfer decisions.²⁵

In 1971, the DoD established the DSAA to manage its foreign military transactions. Currently, the DSAA, with its small staff of approximately 75 people, is losing power and influence to the larger DoD Office of International Security Affairs. The ISA, which is sometimes referred to as "the Pentagon's State Department,"²⁶ sets DoD policy on arms control, defense cooperation, security assistance, and technology transfer issues. Also underneath the DoD umbrella are the various mini-bureaucracies that each individual service has created to handle the support of military sales. Normally, the military service most familiar with a particular weapons system will commit an office entirely to the management of that single system, to include the oversight of any exports that may have been transacted over its lifespan. In addition, the individual services have offices organized by international regions which are dedicated to the support of arms sales in their respective area of responsibility. In the Air Force, for example, each region has an Air Force Security Assistance Training (AFSAT) office to handle training support for aircraft sales, and another Air Force Security Assistance office to oversee material support. All training and support services are itemized on the government-to-government LOA and are included in the total cost of the contract.

One of the more crucial oversight responsibilities of the DoD is to prevent the transfer of weapons technology deemed essential to

preserving US national security. Secondary transfer of exported arms or the technology implemented in their construction is specifically prohibited in most arms agreements. Originally, DoD safeguards were in place primarily to prevent secondary transfers of technology from the importing countries into Communist or other potentially hostile hands. The primary concern is now less centered on Communist nations and more focused on US security interests in the event of a regional conflict. The DoD also attempts to avoid unintentionally bolstering an importing country's military industrial base to the point where it could produce enough of their own weaponry to create regional problems by threatening or executing offensive operations against neighbors. Current DoD policy concerning transfer of conventional arms technology seems to be somewhat inconsistent, and has been criticized by arms control proponents as too loose and undefined,²⁷ by industry figures as too restrictive and undefined,²⁸ and by the GAO as too reliant on the oversight of recipient countries of US funds in FMS sales.²⁹ Doz has identified US "dual-use" technology export restrictions to be a major protectionist constriction in the US' participation in the worldwide high-tech trade.³⁰

The State Department Arms Export Bureaucracy. DoD management of FMS notwithstanding, the ultimate regulatory authority over American arms sales is wielded by the Department of State. The State Department office responsible for international arms sales is the Bureau of Politico-Military Affairs (PM), which in turn supervises the Office of Assistance and Sales (SAS). This office is supposed to be the initial gateway to American arms. The PM performs the first examination of a foreign government's request for arms, and oversees the coordination between the various other bureaucracies who might have input on the transaction.³¹ The list of participating agencies is long. Although most of the decision-making and the actual legwork is accomplished by the State Department and the DoD, the Arms Control

and Disarmament Agency (ACDA) also reviews pending sales, the Central Intelligence Agency (CIA) is granted input, and the Treasury Department gets involved if large sums of government money are involved.³² If the various government agencies all turn in positive input to the SAS concerning a specific arms export contract, the sale is approved on the mid-staff level. But if some of the agencies disagree, all interested parties commence "lobbying" from their respective viewpoints, and the SAS creates a position paper for the Secretary of State outlining the various arguments for approval, disapproval, or modification. The Secretary or the President then exercises his authority to make a final choice on behalf of the administration.³³

Congressional Oversight. Even after all of the above coordination between bureaucracies, arms industries, and the recipient foreign government, the US Congress can still nix any proposed arms transaction, as the AECA endowed the body with veto authority over all arms sales. Serious Congressional debate on individual arms transactions is rare, but several intense debates have occurred on the wisdom of selling our best aerospace systems products to a potentially unstable Saudi Arabia. Proposed arms sales to Saudi Arabia have been uniquely intense episodes in comparison to the numerous arms deals the US has made with other nations over the years, and have involved repeated congressional hearings, behind-the-scenes lobbying and infighting, de facto use of Congressional veto power, and much political grandstanding.

The lack of participation by Congress in the approval process of most arms sales has led to the question of whether the US arms export system works the way the AECA intended. The answer is probably not, as the AECA was created to be a check on a rising flood of American arms exports. Arms control proponents such as Michael Klare have long argued that the current regulatory system possesses a definite tendency to approve rather than restrict proposed arms

sales,³⁴ a logical deduction as few arms sales are actually disapproved or even experience significant political opposition. It would also seem logical that the general trend of a bureaucracy, if not also the Congress, would be to reflect the views of its leader, the President, who personally promotes many large sales and formulates the foreign policy guidelines and atmosphere in which the deals take place.

Another reason congressional disapproval has been so rare is that by the time a transaction comes up for congressional review, the US has already made significant commitments of time and energy negotiating the specifics of the deal with the importing nation. To pull out at the last minute would be a major foreign relations faux pas. This bureaucratic inertia notwithstanding, some arms trade analysts such as Hammond, Louscher, Salomone, and Graham have argued that the US is a "reluctant supplier" of arms in comparison to other arms-exporting nations.³⁵

There is no doubt the system needs some refining, the question is what specific measures are needed. Arms control proponents argue for greater bureaucracy participation and oversight in technology transfer issues, to include detailed examination of possible long-term consequences of transfers.³⁶ They also assert that although there seems to be at least some US consideration of the potential importer's human rights record, there is no clear and defined set of criteria, and as a result human-rights abusing regimes like China can legally buy US weapons systems.

From a totally different perspective, aerospace industry spokesmen claim the government is too restrictive and suggest that the US government needs to recognize the dual-use nature of many technologies and not confuse necessary restrictions of exclusively military technology with commercial or dual-use technology. They also continually remind the government of the fact that these importing countries' business is worth some technology transfer, as

they will only buy their weapons from the countries that give them technology.

ARMS AS A POLICY TOOL

The purpose of such extensive governmental oversight of arms exports is a reflection of their extensive impact on foreign relations. The international marketing of military aircraft, or any other weaponry, is not directly comparable to selling wheat or other classical competitive products.³⁷ National governments control most aspects of the arms market as a necessary means of manipulating links with other governments. Most arms trade and foreign relations analysts view the international exchange of weaponry such as military aircraft to be more of a international relations issue than an economic or business issue. Weapons exports not only affect a country's international trade balance sheet; the equipping of the recipient state's military has a direct effect, stabilizing or destabilizing, on its relations with neighboring countries and on the regional and possibly even trans-regional balance of military power. Arms exports can have ripple effects, impacting not only the recipient country but also its neighbors as they sometimes must somehow counter their neighbor's new capabilities. For these reasons, the export of all weapons, including military aircraft, is strictly controlled by several US governmental agencies under the general purview of the US Department of Defense (DoD) and the Department of State.

America has always justified its arms exports as a foreign policy tool. Arms deals are made to strengthen alliances, intimidate enemies, demonstrate trust, and maintain domestic weapons production capability. During the Cold War the primary thrust behind most arms transfers was the containment of Communism. The purposed threat to the Middle East oil fields of Iran and Saudi Arabia by the USSR was long used as justification for the sale of advanced

weaponry to those two states. Also present was a general motivation, as a mid-1980s State Department pamphlet declares, to "prevent the spread of Soviet influence and the consequent loss of freedom and independence that would entail."³⁸ Although the respective ruling regimes of Iran and Saudi Arabia did not meet the American democratic ideals during the 1960 and 70s, nor does the hereditary monarchy of Saudi Arabia meet them at the present, it was believed to be especially important to maintain strong relations with these two countries. This was both because of their abundant natural resources, and the need to project some type of Western military presence in the Southwest Asia, as the US military has not had a permanent presence in the area since the US withdrawal from Dhahran Air Base in 1962. The 1979 Iranian revolution precluded any further arms sales to the new Islamic Republic (except in trade for hostages), but the same reasoning was used as justification for Saudi sales until the end of the Cold War. As will be explained below, current administrations still use traditional foreign policy language to defend arms sales, but root motivations are much more economically based than found previously. Besides determining the permissibility or desirability of arms transfers, foreign policy objectives tie in directly into the type of weapons deals offered to the various recipients of US arms. US weapons exports can take a variety of forms, be it a straight donation of new or used weaponry, as was common during the 1950s and 1960s when most developing countries could not afford to pay for weapons, or an offer of funds which are subsequently used for the purchase of weapons, in such a manner Israel and Egypt have bought billions of dollars of American weaponry using foreign aid funds given them by the US government. In other cases, the importing country is often offered favorable purchasing terms, such as providing financing or generous offsets, or, as historically has often been the case with sales to Saudi Arabia, the customer can simply pay cash, and all the US government has to do is approve the deal.

The effectiveness of using arms as a means to advance foreign policy goals is hotly debated. Arms control proponents argue that the US has had little success in influencing other countries by selling them arms, and that there has been no demonstrable correlation between arms transfers and the advance of US foreign policy objectives. Proponents of arms sales testify that they are crucial to most friendly governmental relationships, and that countries will turn to other sources if the US does not supply them with their legitimate defensive needs.

ECONOMIC REALITIES VS FOREIGN POLICY

The current US administration seems to exercise the most permissive arms sales policy of recent years, selling weaponry to numerous countries around the globe so as to "strengthen the security of the United States and promote peace."³⁹ President Clinton's national security advisor Anthony Lake has stated that the mission of American diplomats should be "enlarging democracies and markets."⁴⁰ Despite such diplomatic grandstanding, the perception of US arms exports as a job provider and economic boost has risen to the forefront of current US weapons export policy. Although the Clinton administration has not come out on official record that economic concerns drive its arms sales policy, it has been perceived by some that the administration is more committed to boosting the domestic economy than in a delicate wielding of arms sales as a foreign policy tool.⁴¹ The Clinton administration has even considered setting up a financing mechanism to help promote US weapons abroad, as part of sweeping defense procurement changes designed to streamline the procurement process, eliminate unnecessary regulations, and facilitate joint commercial-defense research.⁴²

For the most part, the US Congress has followed the President's lead. Indeed, the bitter congressional battles that marked many arms

transfers in the 1970s and 1980s, especially those designated for Saudi Arabia, have largely become a thing of the past as Congressional members scramble to keep home district defense jobs safe. Aerospace companies have been keen to garner Congressional support for their product; many prime contractors take great care to distribute their subcontracts to as wide a range of Congressional districts as possible. The new Lockheed F-22 will employ parts manufactured in 44 different states.⁴³ In May of 1994, the US Senate Banking Committee unanimously approved measures to lift some of the AECA's export controls on military products, as the Congress debated revising several aspects of this law.⁴⁴

ARMS CONTROL AND PROLIFERATION

An examination of the role of the US government in the transfer of advanced weapons system such as military aircraft with would be incomplete without at least a brief mention of the US policy towards control of the proliferation of conventional weapons and the current status of worldwide arms control regimes. Unfortunately, arms control is too complex a field of study to comprehensively tackle here. The subject is an explosive one, and much arms control literature is long on rhetoric, ranging from a plethora of ideas on how the world can become a safer place through the elimination of weapons ("give peace a chance"), to AIA spokesmen claiming that sugar-coated cereals are a more dangerous export than advanced jet aircraft.

Throughout the 1980s US arms control efforts were almost entirely focused on defusing tensions between the US and the USSR, resulting in the strategic arms reduction talks (START), the withdrawal of intermediate-range nuclear forces (INF) in the European theater, and the Conventional Forces Europe (CFE) agreement to destroy or withdraw most of the weaponry massed in Central Europe. Currently, the US government and the UN are much

more interested in curbing the spread of unconventional weapons of mass destruction, specifically weapons armed with nuclear, biological, or chemical (NBC) warheads or explosive devices, than in limiting conventional weapons such as aircraft.⁴⁵ The US maintains an active role in ferreting out and identifying outlaw producers of unconventional weapons, such as Libya, Iraq, Syria, and Iran. The sale of manned aircraft, as a conventional weapons system, is not considered related to the spread of these unconventional weapons of mass destruction. Although many of these weapons can be and have been delivered by aircraft, they also can be delivered through artillery pieces, by hand, or, most destabilizing of all, by ballistic missile.

This is not to say there have not been a number of analysts, researchers, and organizations actively seeking the cessation of most conventional arms transfers. Some claim conventional weapons are the major cause of international and inter-regional insecurity in the world today, and a wayward diversion of resources desperately needed for economic development. Although their books are regularly published, and some authors, such as William Hartung and Michael Klare, are seen often in the popular press,⁴⁶ their voice is not being heard in a great way at the present time by the US or any other major government. The influence of conventional arms control proponents probably peaked during the Carter administration in the late 1970s, whose initially strong commitment to the restriction of arms exports was eventually weakened by F-15 sales to Saudi Arabia and multi-billion dollar Camp David commitments of arms to Israel and Egypt. In Washington today, Congressional arms-control advocates such as Sen. Mark Hatfield have proposed that US arms sales be tied to the human rights record of the recipient country and their respective progress towards true democracy,⁴⁷ a condition which would possibly deny arms to Saudi Arabia with its ruling monarchy and police suppression of dissidents. Hatfield's measure has not garnered significant support. Outside of the US, arms control enthusiasts put

their hopes in international arms control forums such as the United Nations Department for Disarmament Affairs, or the Big Six, a body consisting of representatives from the US, UK, Germany, France, Russia, and China, countries which control 80% of international arms transfers. Their last meeting in May of 1992, when it was the Perm (anent) Five, resulted in nothing but a general agreement that control of arms transfers is desirable.⁴⁸

On the other side of the debate, backers of military aircraft sales claim that most arms transfer abuses that have occurred have involved unintended secondary transfers of light weaponry or small arms. Small arms are much more mobile than large systems and can quickly fall into the wrong hands. The massacres in Rwanda demonstrated that it doesn't take advanced weaponry to perpetrate atrocities in the modern world.

If advanced systems such as modern aircraft should fall into the wrong hands, the plug can be pulled rather quickly with the withdrawal of crucial technical support and spare parts, as in the case of Iran. Iran's US-built F-14s were used way below their potential during the Iran-Iraq War, as were their F-4s, because they lacked the necessary technical and spare parts support from the US.⁴⁹

1 Austin, p. 37, 109.

2 Austin, p. 37.

3 US armed services are becoming more flexible in allowing export sales to displace their own procurement schedule; the US Navy has specifically indicated this in hopes that export sales will lower the Navy's purchase prices. Tirpak, John. "World Market Forces Improved Military Exports."

4 Armstrong, C. Michael. "Reinventing Government-Industry Relations: Facts of Global Life." Speech delivered at MICOM Advance Planning Briefing for Industry, Nov. 9, 1993.

5 Armstrong speech.

6 Interview with Maj. Doug Fingles, AFSAT training support manager for the Saudi F-15S.

7 Interview with Maj. Doug Fingles. A LOA is the official arms sales contract used for foreign military sales. See Appendix 1 for an example.

8 Isenberg, David. "Desert Storm Redux?" p.437.

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- 9 Ricks, Thomas E. "Pentagon Considers Selling Overseas a Large Part of
High-Tech Weaponry."
10 Aerospace Daily "Lockheed Quotes..."
11 Ricks.
12 Ricks, Fulghum, David A. "Surplus Sales Seen Funding New Buys." As of
Feb. 1994 the proposal was pending final approval, and leading proponent USAF
Gen. Michael Carns was claiming positive responses from Defense Secretary
William Perry, as well as the State Department and industry officials.
13 Interview with Mr. Scott Fawcett, Modern Technologies.
14 Aerospace Daily. "Pentagon's Top ..."
15 Armstrong speech.
16 Porter, The Competitive ..., p. 529.
17 Armstrong speech.
18 Opall, Barbara. " U.S. Industry Pushes Export Finance Fund."
19 U.S. Department of State. Registration: The First Step in Defense Trade. p. 1.
20 Aerospace Daily. "Sale of F-15Is formally proposed to Congress."
21 Klare, American..., p.14.
22 FMS debt is handled by the Federal Financing Bank, but 1988 legislation
permits recipient countries to refinance their arms debts with private banks,
with 90% of the loan's value guaranteed by the US government. Murphy, Paul.
"Lay Down your Arms Debt."
23 Klare, American..., p. 56.
24 Klare, American..., p. 60.
25 Quoted in Klare, American..., p. 71.
26 Klare, American..., p. 61.
27 Klare, Michael. "The Arms Race: U.S. Must Exert Some Control Over
Technology It Exports."
28 Armstrong speech.
29 Remez.
30 Doz, pp. 30-31.
31 Klare, American..., p. 61.
32 Klare, American..., p. 62.
33 For a good explanation of the approval process, to include a hypothetical walk-
through of a Saudi F-15 sale, see Klare, American..., pp. 67-74.
34 Klare, American..., p. 26.
35 Hammond, Paul Y., David J. Louscher, Michael D. Salomone, and Norman
A.Graham. The Reluctant Supplier: U.S. Decisionmaking for Arms Sales.
36 Klare, "The Arms..."
37 For some of the special characteristics of the US arms industry in comparison to
other, less regulated industries, see Reppy, Judith. "The United States:
Unmanaged Change in the Defence Industry." p. 61.

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- 38 U.S. Department of State. Security and Arms Control: The Search for a More
39 Stable Peace, p. 7.
- 40 Quoted in Horvitz.
- 41 Sciolino, Elaine, with Eric Schmitt. "Chilly Partners--A Special Report..."
- 42 Horvitz.
- 43 Vartabedian.
- 44 Horvitz.
- 45 Hamashige, Hope. "Southland Defense Contractors May Get Export Relief."
- 46 For instance, the UN Office for Disarmament Affairs devoted over half of its
47 1991 Disarmament Yearbook to NBC issues, but only one-seventh to
48 conventional disarmament. U.N. Office for Disarmament Affairs. The
49 United Nations Disarmament Yearbook.
- 46 Hartung, William D. "The Phantom Profits of the War Trade," p. F13. Klare,
"The Arms.... "
- 47 Horvitz.
- 48 Horvitz.
- 49 This is excepting, of course, the spare parts that did make it to Iran through the
US-Israel arms-for-hostages pipeline.

Chapter 5:

THE MILITARY AEROSPACE MARKET IN SAUDI ARABIA

The country of Saudi Arabia has been the most lucrative arms market in the developing world. Since 1984 alone, the kingdom has invested an estimated \$150 billion on its armed forces, as the country continues to build an ultra modern, high-tech military literally from the ground up. Annually, Saudi defense expenditures consume 30 percent of the official budget,¹ one of the highest percentages in the world.

The Royal Saudi Air Force (RSAF) has remained the Saudi armed service with the highest prestige and highest budget. The RSAF fields some of the most advanced and lethal airplanes in the world; both the McDonnell Douglas F-15C interceptor and, as of late 1995, the F-15E ground-attack model, the Panavia Tornado, and the Boeing E-3 AWACS, not to mention older but still effective Northrop F-5E interceptors and ground-attack aircraft.

The recent (post-Gulf War) multi-billion dollar sales of American arms to Saudi Arabia are often characterized as an overreaction to the Kuwaiti invasion, an unnecessary inflation of existing tensions between the Gulf nations, and the result of irresponsible and overaggressive marketing of lethal wares by arms companies and the United State government.² Examination of the historical record of Saudi Arabia's military buildup, specifically its aircraft and related infrastructure purchases, demonstrates that the RSAF's post-Gulf War aircraft procurement was merely a slight acceleration of a long-standing acquisition strategy which was, and remains, sound when examined in the light of the Saudis' inherent defensive weaknesses.

This chapter begins with an outline of Saudi Arabia's requirements for the military defense of the kingdom, and continues

with a summary of the historical development of the RSAF, paying special attention to its most recent sales agreements. By demonstrating a logical procession in the technology and capability levels of Saudi aircraft, it can be postulated that the recent increase of military sales in the wake of Gulf War can be best analyzed as a temporary upsurge.

The current and future Saudi markets for aircraft are subsequently examined, to include new Saudi financing concerns and offset requirements. While the short-term prospects for mega-sales of military aircraft to Saudi Arabia are weak, the future is best examined in the long-term, which presents a brighter perspective for arms exporters, although certainly not without risk. The primary risk will be demonstrated to be the possibility of internal opposition overcoming the Saud family's monopoly of political power.

The United States' dominance in the Saudi Arabian military aerospace market has been actively contested by France and Great Britain, in alliance with her industrial partners Germany, Italy, and Spain. Great Britain has experienced success in marketing aircraft to Saudi Arabia, but France has not since the 1960s, despite the fact that it has equipped several of Saudi Arabia's GCC neighbors with most of their respective jet aircraft, and has supplied Saudi Arabia with much of its naval and ground weaponry. The chapter concludes with several projections of how future Saudi and American political developments could possibly result in greater European penetration of the Saudi market.

DEFENSIVE OUTLOOK

Saudi Arabia has chosen to devote attention to its air force for specific reasons. Described below are Saudi Arabia's unique defensive needs. In response to these requirements the Saudis have chosen to build and maintain a capable air force which has, by necessity, a

technological edge over its potential foes, and has the capability to be easily integrated into a joint force with US forces in a major crisis. The military defense situation in Saudi Arabia requires and will continue to require a high-tech, mobile force which can respond to a threat decisively and on short notice-a mission best suited for an air force. Also needed is an ally which would guarantee help in the face of a potentially overwhelming enemy, and only the United States has the capability to deliver on such a guarantee.

Saudi Arabia is a large, resource-rich country with a regionally small population, and is literally surrounded by actual and perceived threats to its sovereignty. The fundamentalist regime of Iran, a mere 16 minute jet flight across the Gulf, is currently portrayed as the most serious military threat to the kingdom. Iran and Saudi Arabia are locked in a struggle for political dominance in the Persian Gulf region. Iran is actively enlarging its military, purchasing jet aircraft, tanks, and even submarines from Russia and China in recent years. Iran has been implicated in the active support of several Islamic fundamentalist and Shi'ite opposition movements in Saudi Arabia during the 1980s and 90s.³ Some intelligence reports have indicated that the Iranian regime recently deduced that a military conflict with Saudi Arabia and the other Gulf Cooperation Council (GCC) nations over the Tumbs and Abu-Mousa islands in the Strait of Hormuz is inevitable, and began preparing militarily for a confrontation in that specific theater as a show of strength.⁴

To the north, Saddam Hussein's Iraq lies in temporary reclusion, but his expansionist desires, which culminated in the Iran-Iraq War during the 1980s and in the Iraqi invasion of Kuwait in 1990, remain all-too-recent memories. In the northwest lies the maligned state of Israel, the only country in the Middle East currently capable of repeated air strikes to any point in the kingdom, not to mention the threat of its purported nuclear ballistic missile force.⁵ To the south, the relatively populous country of Yemen (or alternately countries,

depending on the latest stage of their continuing civil struggles) has been the scene of numerous border conflicts with Saudi Arabia over the years, dating back to 1934 when Saudi King Faisal annexed the historically Yemeni region of Asir. Saudi Arabia has continued to intervene in Yemeni politics, working hard to undermine President Saleh's attempt to reunify the country.⁶ Saudi Arabia has also not resolved a number of border disputes with its GCC allies, to include Qatar, Oman and the United Arab Emirates. Finally, even to the west, Saudi faces a resurgent fundamentalist threat across the Red Sea in the Sudan, a country which has been recently implicated for covert support of the growing fundamentalist opposition to the rule of the House of Saud.

Not only is Saudi Arabia surrounded by potential antagonists, the actual land mass its armed forces are responsible to defend constitutes a very large area, totalling 2.15 million sq km, which is approximately equal to the size of the United States east of the Mississippi River.⁷ Saudi Arabia's long, unmarked and sometimes disputed borders are mostly in remote, unpopulated areas which, because of the largely level and unchanging terrain and a harsh desert climate, can not be easily defended by border forces. The most geographically valuable areas of the country are its oil fields. Most of Saudi Arabia's oil fields are located in the eastern region near the Persian Gulf, close to both Iraq and Iran. They contain many vulnerable processing and refining facilities, the destruction of which would greatly disrupt Saudi's vital oil exports.

Along with Saudi Arabia's large land mass and many potentially hostile neighbors, the country also possesses a relatively small population. The 1992 census counted 16.9 million Saudis, of which 12.3 million were considered nationals.⁸ These figures are not to be taken for granted, the Saudi government has often been accused of inflating its population statistics. Some outside analysts estimate the actual population to be around 11.4 million, with 8.1 million

considered native Saudis.⁹ This population is to be compared with approximately 60 million in Iran, 20 million in Iraq, and 10 million in Yemen.¹⁰ Although Saudi is a wealthy country, it is a newly wealthy country without a long history of employing, much less manufacturing, modern technology. Subsequently, the mostly young population of Saudis, although well-educated by developing world standards, as a whole lacks the skills base necessary to maintain a large military.

Because of its large size, numerous threats, and small population, the Saudis have chosen, largely on recommendation by several U.S. military and contractor studies,¹¹ to construct a military defensive structure anchored by an air force equipped with the best technology available. A modern air force's superior speed, flexibility, and rapid response time was considered best suited to defend a large area with a limited force size. The RSAF was designed to be able to quickly mass a large amount of firepower from a diverse spread of forces and concentrate it on the point of attack. As previously mentioned, a border incursion into Saudi Arabia could come from any of a number of directions, and possibly with very little warning time in the event of a surprise air attack. To effectively guard all of its vulnerable border areas would spread the Saudi army hopelessly thin. Moreover, of all the three services-army, navy, and air force, the air force is the most capable of cross-reinforcing the others.

Saudi defense planners have hoped to build a credible deterrent force which could repulse or delay the first wave of any attack. In addition, the Saudi ruling family has historically believed that a strong military increases their political legitimization among their well-armed Middle Eastern neighbors, giving Saudi Arabia a greater aura of independence and a more worthy claim to be the official defenders of Islam's holy sites in Medina and Mecca.¹² It has always been understood that in the event of a sustained attack, the Saudis would have to rely on outside help to defend the country. Since the fall

of the Shah in 1979, it was accepted that the US would be this intervening power, although the two countries have never signed any formal security agreements.¹³ To this end the Saudis have poured billions and billions of dollars into the construction of a vast military infrastructure, nearly all designed to be entirely usable by US military forces in the event of a major crisis. Their effort proved to be a success during Desert Storm, when US units found many of the Saudi facilities to be superior to some of their own home base facilities.

The events of Desert Storm established the viability of much of the Saudis' defensive planning. The war decisively demonstrated that the employment of superior technology in the air theater was crucial to victory, especially in the wide open terrain of the Arabian desert, where Iraqi ground targets had little place to hide from the unending allied bombardment. The war also demonstrated the less palatable side of the Saudi's overall defensive strategy, specifically that the Saudis would have to rely on outside assistance in the event of an overwhelming foe, which Iraq surely would have been had Saddam Hussein ever chosen to invade the Kingdom.

HISTORICAL BACKGROUND

Upon examination of the historical record, it becomes apparent that post-1965 Saudi military aerospace imports have reflected the priority of building up the RSAF as Saudi Arabia's first and most important wave of defense against a potential foe. The progression of purchases by the RSAF, and the trend of Saudi military purchases in general during the period, demonstrates a steady growth curve in technology and cost. The \$30 billion worth of military orders placed in the four years since Desert Storm was not exactly a gigantic surge in this pattern. Saudi military spending during 1985-89 has been estimated to total \$23.04 billion, and during 1988-91 to total \$26.8 billion.¹⁴ Furthermore, this post-Desert Storm "surge" is being

tempered by the scarcity of new orders predicted in the short-term, and by the negotiated extension of payments for current orders.

Despite numerous caricatures by the Western and Arab popular press of Saudi Arabia being a grossly oversold customer of ridiculously expensive equipment which it does not need and can not properly use, there is a discernible method to the Saudis' buying "madness". A case-by-case analysis of the Saudi purchases over the past thirty years will demonstrate how the RSAF evolved from nothing into a reasonably credible military force fielding some of the most advanced weaponry to be found in the developing world, despite setbacks, abuses, unnecessary expenditures, and extensive reliance on outside help. The creation and development of the RSAF was a notable achievement over this time period, although some of their specific purchase decisions and buying procedures have not been commendable. During the 1960s and 1970s especially, purchase commissions to royal family members and arms brokers like Adnan Khashoggi reached truly scandalous proportions, and arms companies sometimes seemed to hard-sell weapons systems regardless of any tactical considerations.

The military establishments of Saudi Arabia and the US have shared an intimate relationship dating back to the 1950s, when US military training missions equipped the Saudi military with several small shipments of heavy equipment, to include nine Douglas B-26 piston-engine tactical bombers and a dozen F-86 Sabre fighters.¹⁵ The first comprehensive air defense procurement package between the two countries was not completed until 1965, providing a logical starting point for this study.

The military-to-military relationship of the US and Saudi Arabia has been particularly close between the two countries' respective air forces. This is significant because the RSAF is the most prestigious military service in Saudi Arabia, and the linchpin to the Saudi defensive strategy of a quick-response, first wave defense

against potential attackers. Over the past thirty years of Saudi Arabia's military buildup, the kingdom has garnered a reputation as relying on a diversity of suppliers for its weaponry in an attempt to avoid overdependence on a single supplier, or at least the appearance thereof. Although this reputation has been proven true in the Saudi army, and, to a lesser degree, in the Saudi navy,¹⁶ the RSAF has relied primarily over the past twenty-five years on US aircraft manufacturers to supply its military aircraft. The one significant exception, the 1985 purchase of Tornado aircraft from Great Britain (a contract on which the Saudis exercised a additional buy option in 1993) came about largely because of US congressional opposition in 1984-5 to selling to the Saudis their first choice of McDonnell Douglas F-15 interceptors. The models found in the Saudi's current air order-of-battle tell the story, nearly all originated from the United States.

Table 5.1

The Royal Saudi Air Force Air Order-of-Battle

Company/Model	Country of Origin	1st Year of Delivery	Number on Hand
<u>Interceptors</u>			
McDonnell-Douglas F-15C/D Eagle	US	1978	93 (24 on order)
Panavia Tornado ADV	Great Britain	1985	24
<u>Attack</u>			
McDonnell-Douglas F-15E Eagle	US		48 (on order) start 1996
Panavia Tornado IDS	Great Britain	1985	48 (48 on order)
Northrop F-5B/E/F Tiger II	US	1971	98
<u>Reconnaissance</u>			
Northrop RF-5E Tigereye	US	1971	10
<u>AEW</u>			
Boeing E-3A Sentry	US	1986	5 (4 on order)
<u>Tanking</u>			
Boeing KE-3A	US		8
Sentry (also functions as an ELINT collector)			
Lockheed KC-130H Hercules	US		8
<u>Transport</u>			
Lockheed C-130E/H Hercules	US		46
Airtech CN.235 C-212A	Spain/Indonesia Spain		4 30
<u>Trainer/Lgt Attack</u>			
Hawk	Great Britain		30 (60 on order)
BAC-167	Great Britain		36

Source: Compiled by author from Jane's Intelligence Review, Cordesman's After the Storm..., and Peacock's The World's Air Forces.

As previously mentioned in Chapter 2, aerospace products are marketed more from product differentiation than simple cost leadership strategies.¹⁷ The US aerospace industry has successfully differentiated its aircraft from European competitors in Saudi Arabia by adding unique value to their products. The value of American military aerospace products did not only stem from aircraft performance characteristics and technical capability. The value added by the US government was equally important. The US government increased the value of American aircraft because of the advising, training, maintenance support, and security services provided to the RSAF. The following historical outline of major Saudi aerospace purchases will demonstrate how Saudi buying motives have been a mix of both product and political considerations.

The Saudis have not devised their defense programs independently, from the start they have sought Western, especially US, advice on the formation of their defensive and subsequent procurement strategy. Typically, in the wake of a regional crisis the Saudi government has requested the US to provide a military and/or contractor mission to help them formulate a defensive strategy, to include a arms procurement plan. Once a plan is created, actual attempts to acquire the proposed defense systems are initiated, and it is at this point where political considerations begin to adulterate the strategic soundness of the mission's recommendations. Table 4.2 demonstrates this pattern of crisis, US advisory mission, and US aircraft purchase.

Table 5.2

Saudi Aircraft Purchasing Pattern

CRISIS	ARRIVAL DATE U.S. ADVISORY MISSION	AIRCRAFT PURCHASED
Yemeni Civil War and Egyptian Intervention	1965	BAC Lightning
British Withdrawal From Persian Gulf	1970	Northrop F-5
1973 Arab-Israeli War	1973	McDonnell Douglas F-15
Iran-Iraq War	1980	Boeing AWACS Panavia Tornado
Gulf War	1990	McDonnell Douglas F-15E

The Saudis' first real air defense plan in 1965 is a case in point. At the time, Saudi Arabia's primary strategic concern was the ongoing civil war in Yemen. The Egyptian intervention there included the bombings of Saudi border towns, which the Saudi military was seemingly unable to stop. The original American study recommended an air defense package built around the purchase of US-built F-104 Starfighter aircraft and HAWK surface-to-air missiles (SAMs). However, by the time the \$400 million deal was closed with the US and Great Britain, the Saudis ended up with less-capable British Aircraft Company (BAC) Lightning fighters by way of an unusual three-way deal in which the British were able to offset their purchase of American F-4 fighters with the Lightning sale to the Saudis.¹⁸

In 1970, the Saudi government again requested the US to send a dedicated military mission to study their strategic environment and

defense forces (excluding the army and National Guard), and to help them prepare for the impending British withdrawal from the Gulf and the Egyptian withdrawal from Yemen. The American mission, headed by Major General O.A. Leahy, counseled the development of a complete reorganization of the Saudi Ministry of Defense and Aviation, and the formation of a detailed 5-year defense plan. The mission also recommended, among other things, that the RSAF retire its few obsolete F-86 fighters and reinforce their air order-of-battle with newer aircraft.¹⁹

Most of the recommendations of this commission were not carried out. Too much overt military cooperation with a strongly pro-Israel United States was politically indefensible at the time. This period probably marks the low point in the RSAF. The organization had earned the deep mistrust of the royal family; several pilots had defected with their aircraft to the Egyptians, and in 1969 a coup plot by RSAF officers to bomb the royal palace had been discovered. Subsequently, the RSAF ranks suffered a severe purging.

The Northrop F-5. The most significant strategic move by the RSAF over the following four years was the purchase, under the first Peace Hawk program, of 55 Northrop F-5B/E jet fighters for a price of \$171 million. The deal was supplemented by an accompanying \$277 million contract for the construction of necessary infrastructure, the training of personnel and the supply of supporting equipment.²⁰ Deliveries of Saudi F-5s continued on and off until 1984-1985.²¹ An inexpensive, maneuverable fighter that is found in the inventories of many nations, the Saudi F-5s are still in operation today, although they are currently used only in a defensive back-up role.

In the early 1990s, the Saudis' went shopping for a fighter to replace their F-5Es, but their current payment and budget difficulties (described below) will probably push back this purchase for an indefinite time.²² The two reported front-runners were the McDonnell

Douglas F/A-18 and the Lockheed F-16.²³ Refitting the RSAF F-5s with new avionics and/or engines is also an option. As the F-5 was a very successful export fighter, currently there is a thriving market for F-5 upgrade kits. Many developing countries are opting for the cheaper choice of refitting and improving their F-5s rather than purchasing expensive, new planes. It is doubtful the Saudis will go this route, although they have indicated that they have no intentions of retiring their aging F-5 fleet in the near future.²⁴

The McDonnell Douglas F-15. Saudi Arabia requested another military mission in 1973 to survey their defensive situation, this time in response to the 1973 Arab-Israeli war. The forty-five man American delegation recommended that the RSAF replace their British Lightnings with a cutting edge fighter like the F-14 (purchased by Iran in the mid-1970s), F-15, F-16, or F-18. After a trip by a Saudi delegation to the US during which Saudi pilots test-flew both the Grumman F-14 and the McDonnell Douglas F-15, the Saudis put in a strong request for the F-15. After some internal debate, the Ford administration agreed to sell the Saudis the fighter of their choice. The deal was actually closed in 1979 during the following Carter administration. Despite its strong anti-arms sales stance, the Carter administration agreed to complete the deal as they felt the US relationship to Saudi Arabia was too important to endanger by welshing on the agreement.²⁵ The US Congress was successfully persuaded to approve the sale after the Carter administration agreed to remove bomb racks, in-flight refueling equipment, and advanced air-to-air missiles from the package, so as to minimize any possible threat to Israel's national security.²⁶ Saudi Arabia thus became the second (Israel was the first) country in the Middle East and in the developing world, to field what is still considered by many to be the best fighter aircraft ever manufactured. The RSAF F-15C/Ds are currently

being upgraded by the McDonnell Douglas Corporation as part of the RSAF F-15 Multi-Stage Improvement Program (MSIP).²⁷

The 1979 F-15 sale was a complicated affair involving oil, finance, and balance of payments considerations, as well as Congressional concern for the maintaining the national security of Israel. Political intrigues were legion. Saudi officials conducted an unprecedented amount of lobbying to persuade the US to complete the sale, to include hints by Saudi oil minister Sheik Ahmed Zaki Yamani that a refusal could affect his country's oil policy and its support for the dollar.²⁸

Throughout the 1970s, Saudi Arabia used its seemingly ever-increasing oil revenues to purchase vast amounts of military hardware and to construct modern military facilities to house this new weaponry. By 1980, the kingdom ranked sixth worldwide in total military spending and was first in expenditures per capita.²⁹ During this period, a large percentage (50-70%) of what was classified by US Foreign Military Sales (FMS) definition as US military exports to Saudi Arabia was actually money used for the construction of military facilities, rather than on actual weaponry. The Saudis realized they needed to create the necessary military infrastructure before they could successfully implement modern weaponry. The construction was also viewed as necessary in the eventuality of American forces deploying to the region in defense of the kingdom. By the late 1980s and early 1990s, Saudi spending on FMS construction sales was down to a fraction of what it was, in FY 1983 alone the Saudis spent more on construction than in the FY 1986-1992 combined.³⁰

The Panavia Tornado. In July of 1985, US congressional supporters of Israel successfully blocked the sale of additional F-15s to Saudi Arabia. The Saudis were miffed and quite embarrassed by the entire incident. British Prime Minister Margaret Thatcher took advantage of the impasse, and, with the permission of the US, offered to sell the

RSAF the new Panavia Tornado. The subsequent 1986 Al-Yamamah agreement was a unique document, less a sales contract than a barter deal in which Saudi would pay for British warplanes with oil. The initial offering included 48 Tornados, both ADV interceptors and IDS ground attack models, as well as purchase options for 60 Hawk trainers, BAe communication aircraft, six minehunting ships, and 88 Blackhawk helicopters.³¹ Also included in Al-Yamamah were a long list of additional option-to-buy offers for the Saudis. The latest option to be exercised by the Saudis, after heavy lobbying by British government officials, was the order of an additional 48 Tornados in 1993. Estimates of the total worth of the Al-Yamamah contract range between \$22.5³² and \$32 billion, with British Aerospace (BAe) operating as the prime contractor for most of the aircraft.³³ The latest Tornado order will keep BAe assembly lines open until production begins on the new European Fighter Aircraft (EFA) somewhere around the end of the century.³⁴

The Al-Yamamah agreement includes an offset specification in which 30 percent of the technical content of equipment ordered is to be reinvested in the Saudi Arabia.³⁵ Both the British and the Americans have experienced difficulty in fulfilling the offset requirements of their arms agreements, as the military industrial base of the Saudis is very limited. The oil repayment specifications have also complicated the Al-Yamamah agreement, as the contract was signed with the false assumption of future high oil prices. Presently, the Saudis are making up the difference with increased exports of crude as well as cash payments.³⁶

In the opinion of some analysts, Al-Yamamah has been also blighted by the checkered performance record of the Tornado aircraft. The RSAF experienced technical difficulties with their first models, and several Tornados were lost during Desert Storm. Saudi Arabia is the only developing country to have imported this expensive aircraft.

The Boeing E-3 AWACS. Saudi Arabia is also the only non-Western country fielding the Boeing AWACs, an ubiquitous aircraft with its large, rotundical radar dome protruding from its fuselage, and possessing the on-board capability to monitor the complexities of the modern air battlefield while simultaneously directing Saudi defending aircraft to multiple ingressing hostile targets. The political battle waged between the newly elected Reagan administration and a skeptical Congress over this sale was the Reagan team's first hotly contested foreign policy decision. Only some last minute lobbying of a few key senators by President Reagan himself saved the proposal from legislative disapproval.

The reasons Saudi Arabia desired this complex and expensive weapon system are well-documented in Cordesman's The Gulf and the Search for Strategic Security, and result from the previously described unique strategic situation in Saudi Arabia.³⁷ By the early 1980s, the US DoD was making annual studies of Saudi air defense requirements under the Peace Hawk program. The USAF recommended constructing a broad array of radar and command, control and communication (C3) facilities which would require an airborne sensor platform like the AWACS to operate efficiently.³⁸ To summarize the strategic rationale in short, for an air defense radar system to work optimally, it must operate from an elevated position. On Saudi Arabia's eastern coastal region, near the high threat countries of Iran and Iraq, there simply is no high ground, and so a ground-based radar in that location would not be able to detect an airborne threat with any type of reasonable warning time unless the Saudis deployed an inordinate number of ground-based radars—at least 48 would be necessary. In contrast, the entire Persian Gulf coastline could be covered sufficiently by four or five airborne AWACS, with their minimum detection range of 175 nm for a target flying at 300 feet.³⁹

One of the primary objections to the AWACS sale was the possibility of technology transfer into hostile hands if the Saudis were ever militarily defeated. Subsequently, the five AWACS delivered to the RSAF were not equipped with all of the same advanced electronics systems found in the US or NATO models.

The McDonnell Douglas F-15E. As of November of 1995, the newest aircraft in the RSAF inventory will be the McDonnell-Douglas F-15E, advertised as the most effective ground attack aircraft in the world. The F-15E weapon system demonstrated its effectiveness in Desert Storm, where the open desert terrain lent itself well to the F-15E's LANTIRN targeting pods, and it proved a excellent platform for a wide variety of air-to-ground munitions.

In the middle of a close election in the fall of 1992, President George Bush closed the F-15E sale with Saudi Arabia, as the Saudis agreed to pay \$9 billion for a total of 72 aircraft with accompanying weaponry and equipment, to be delivered in intervals from the end of 1995 through 2000. Attached in Appendix 1 is US F-15E Letter of Offer and Acceptance (LOA) cover sheet, as well the agreement's initial payment schedule and some of the itemized expenses. The deal came at a very opportune moment for the then-struggling McDonnell Douglas company, as US F-15 orders had run out. The Saudi order, in conjunction with a nearly concurrent Israeli sale, will keep the F-15 assembly line in St. Louis running until at least 2000. McDonnell Douglas currently has 800 employees in Saudi Arabia working in technical support of the F-15S and other projects, with 400 more employees on the way.⁴⁰

The Saudi version of the F-15E, labeled the F-15S, will give the RSAF significant new capabilities in air-to-ground interdiction, although it will not be equipped to operate as capably as the US models or the new Israel F-15I version. Although the F-15S is equipped with the same Hughes APG-70 radar as US F-15Es, its software will be

"detuned", thus deleting some of the F-15S's targeting capability and electronic counter-measures (ECM) as well as on-board radar mapping.⁴¹ Furthermore, much of the ordnance and missiles included in the overall package are not the very latest models available.

Although the US is ready and willing to equip the RSAF with such a high-tech weapon system such as the F-15S, US foreign policy still dictates that Israel must continue to maintain a qualitative edge in the Middle East arms arena. Thus, unlike the Saudi F-15S, Israel's F-15Is are virtually identical to USAF F-15s, despite the official Pentagon pronouncement that the Israel²ⁱ plane is a "step below" the US F-15E.⁴²

A significant factor in the F-15S purchase was the RSAF's 15 years of valuable field experience with the C/D version of the F-15, which ensured that many of the support structures, systems, and people for the F-15S were already in place. Another factor was the Saudis' recognizance of the mutual benefits to the kingdom and the US of keeping the F-15 production line open for several more years. The Saudi Arabian government realizes their purchasing decisions directly impact the health of the US military industrial base, and they also believe the more they tie themselves into US national security interests, not only as an oil supplier but as an essential customer of its military industrial base, the more the US will be willing to come to the aid of the Saud ruling family in the face of an external, or possibly even internal, threat.

Transports and Tankers. The RSAF has purchased nearly all of its transport and tanker fleet from the US. The RSAF's first tankers were KC-130s, but in the 1980s they were supplemented with several jet-engined KC-707s, which were necessary for aerial refueling of the RSAF's F-5s, AWACS, and F-15s, as well as American over-the-horizon reinforcements.⁴³ The RSAF's aerial refueling capability

provides the force much more flexibility in mission planning, to include long-range bombing strikes, and also gives patrolling RSAF fighters and AWACS combat air patrols increased endurance.

RSAF transport aircraft have tended to be ordered on a more gradual basis than the previously described weapons systems, and with less controversy as their sale is not perceived as exacerbating the Middle East arms race, since they are unarmed and do not employ particularly advanced electronic systems. Transport exports have never been seriously challenged by the US Congress. If anything, the US government promotes their sale. The Clinton administration in the person of Commerce Secretary Ron Brown directly intervened in a sale of 17 Lockheed C-130 transports in the summer of 1993, urging Saudi officials to complete the planned delivery of the remaining 7 aircraft, which the RSAF had not yet accepted due to cash flow problems.⁴⁴

CURRENT AND FUTURE MARKET

The immediate future market for military aircraft exports to Saudi Arabia is bleak. Continued sagging oil prices, budget cutting by the Saudi government, and the burden of fulfilling current arms debt obligations will quite likely preclude any future large contracts in the near future. The large boost in Saudi arms purchases immediately following Desert Storm was only a temporary upsurge, especially when you consider the fact that the Saudis successfully lengthened their payment schedule for the single largest purchase of the period, the 72 new F-15Ss. According to Richard Grimmett, a long-time arms trade analyst for the Congressional Research Service, the Saudis have already purchased most of the weapons systems they feel they need in the short term, and are quite unlikely to close any more major deals for years.⁴⁵ In a brief address on the adoption of the 1995 budget, King Fahd was quoted as stating "...about the financial conditions resulting

from the Gulf War and oil prices; and I have promised ...to deal with them until matters are restored to what they used to be in strength and balance."⁴⁶ Most analysts predict this will include keeping a lid on the Saudi defense and security budget, which will officially amount to SR49,492 million (\$13,215 million) in 1995, out of an estimated SR135,000 million (\$36,048 million) of revenues.⁴⁷

The current Saudi recession will hopefully enforce some fiscal discipline upon the military acquisition process. Many individual weapons systems are the "domain" of a designated senior member of the royal family. Although this prince's name may not appear on the official international trade contract, it is he who doles out the supporting subcontracts, and is thus sometimes responsible for "notorious rake-offs which balloon government contracts far beyond their real value."⁴⁸

Many other inefficiencies are found throughout the entire arms transfer process. For example, while the RSAF has a maintenance depot in-country that is fully certified to handle heavy maintenance on their F-5s, it is alleged that foreign contractors continue to accomplish most F-5 maintenance at other locations because the RSAF will not efficiently operate their own depot. The RSAF officer's outlook on his military calling is not directly comparable to his Western counterparts, while he may love to put in those flying hours, his devotion to duty is sometimes divided as he will quite possibly be involved in other vocations such as business.

Another inefficiency endemic to the entire aviation industry, both civil and military, is its cyclical nature, as common to arms purchases in general. It is unwise to use any one or two years' sales total as a benchmark for comparison or projection of future sales. For instance the \$33 billion total of US weapons exports worldwide in 1993 was unusually high because it included several large, one-time deals such as the \$9 billion Saudi F-15 sale. Saudi Arabia spent \$12.5 billion on US weaponry in 1993 (as estimated before the F-15 restructuring

agreement), but only \$1 billion in FY1994 and \$2.6 in FY 1995.⁴⁹ Of more value than plotting growth curves is an estimation of the age and longevity of a customer's current fleet and a projection of their future needs and income. In the case of the RSAF, an examination of Saudi air order-of-battle confirms that the RSAF could feasibly not initiate any more large aerospace contracts for until it has met current commitments and fully utilized the aircraft already in its inventory.

The future Saudi market will continue to rely on weaponry that gives the kingdom a technological edge over its neighbors. High-tech remains the only force equalizer for the Saudis, as Saudi manpower will remain a problem-its population will not catch up with its neighbors any time soon. Saudi Arabia will continue to rely on the US for over-the-horizon reinforcement in the face of an all-out attack for a long time. This does not preclude the need for an effective first-wave defense which Saudi Arabia can operate as an deterrent against a preemptive air strike on Saudi oil facilities or desalinization plants, or against the intermittent border incursions so common in that area of the world. Furthermore, the billions of dollars paid to allied nations after Desert Storm, as well as US Defense Secretary William Perry's attempt to persuade the Saudi Arabia to help pay for the \$500 million cost of the US mobilization in response to Saddam Hussein's October, 1994 massing of Iraqi troops on the Kuwaiti border,⁵⁰ demonstrated that dependence on the US for defense of the kingdom can be nearly as monetarily and politically expensive as building your own military.

The question still remains whether Saudi can successfully weld its massive acquisitions into a truly effective fighting force. The RSAF garnered for itself a good reputation during Desert Storm, but it still has to prove it can fight effectively without large-scale US assistance. Regional allies are scarce; an effective military alliance with any of Saudi's GCC neighbors is at least 15 years away, if not much longer.

FINANCING

Historically arms deals between the Saudi and US governments were negotiated on an informal basis, and often "sealed with a handshake." The Saudis were proud of their reputation for paying cash, and, unlike the usual case with arms exports, the actual financing of the deal was not a major issue. The country of Saudi Arabia accounts for such a large percentage of FMS sales, that in the Air Force Security Assistance bureaucracy, it is the only country that rates its very own country manager, other countries share country managers with their regional neighbors.⁵¹

This atmosphere of informality has now disappeared. The Saudis used to maintain a multibillion surplus in their FMS account,⁵² but by 1992 their balance had dipped so perilously low that on several recent occasions US contractors in Saudi Arabia had been within one day of leaving the kingdom per directive from the Pentagon, after stop work orders were issued because of the Saudis' failure to make timely payments. Poor budgetary practices by the RSAF have resulted in several recent mini-crises in which the RSAF has found itself unable to meet monthly obligations, and as a result contractors, especially McDonnell Douglas, have been asked to defer billings worth \$60 million from Dec. 1995 to Jan. 1996.⁵³ Bookkeeping problems is not just a RSAF predicament but is a nationwide problem. For example, the two-year arms spending binge following the Gulf War, which was largely conducted by Saudi ambassador to the US Prince Bandar bin Sultan, was poorly coordinated with the Finance Ministry, who subsequently did not enter all of the purchases on the national budget.⁵⁴

These payment problems, along with the much-publicized restructuring of the financial specifications of the 1992 F-15E deal, have irreparably damaged Saudi's credit reputation. The F-15E deal set a new precedent for the Saudis as they searched for a credit line to

finance the purchase from a number of sources, to include the US Export-Import Bank, US commercial banks and Saudi financial institutions. Reportedly, Saudi Ambassador Prince Bandar requested defense executives from McDonnell Douglas, Hughes, Raytheon, FMC and General Dynamics to help the Saudis secure financing,⁵⁵ and the three US banks involved in the subsequent negotiating were Citibank, Chase-Manhattan and J.P. Morgan.⁵⁶ The Saudis sought to delay payments and some deliveries only, no major weapons programs were cancelled. Reportedly, the loans were to be taken out by a shadow corporation formed by the above companies, so the loan would not appear on Saudi or company balance sheets. Saudi Arabia would pay the interest and guarantee payment.⁵⁷

Saudi Arabia has to date retained a triple-A credit rating despite these problems,⁵⁸ although not without controversy. In 1993 there was serious debate amongst various branches of the US government, including the Federal Reserve and the Treasury department, on the possibility of lowering the Saudi's official credit rating. If implemented, the act would have had serious repercussions on the availability of credit for the Saudis from the international banking world, and on the financing of their arms purchases.⁵⁹ In an attempt to improve their fiscal situation, the Saudi government is hoping to restructure their weapons repayments to Great Britain and France as well as the US.⁶⁰

Financing of American arms purchases will continue to be a sensitive issue. Perhaps some future Saudi weapons deals with the US will follow the weapons-for-oil example of Al-Yamamah and other European arms sales agreements, especially as the US' dependency on imported oil continues to increase.⁶¹

OFFSET REQUIREMENTS

One of the major selling points in the modern international arms market are the offset specifications of the arms contract. Like many other developing countries, Saudi Arabia has implemented offset requirements into all its recent arms contracts in an attempt to nurture its own nascent industrial base, to slow a sometimes massive cash hemorrhage to the exporting country, and, in the case of the US, to increase strategic interdependence between the two countries.

As specified under the current Saudi arms procurement regulations, 30 percent of the total worth of the 1992 F-15S contract is to be reinvested back into Saudi Arabia. One of the primary vehicles for reinvestment will be the Saudi Arabian Advanced Electronics Company (AEC). McDonnell Douglas will be providing AEC with the necessary technology and manufacturing equipment to construct electronic circuit boards. McDonnell Douglas estimates the worth of the agreement to total over \$50 million in the next ten years.⁶² AEC has also contracted with Lockheed to produce and export (the first Saudi weapons export) more than 3000-5000 electronics units for Lockheed F-16s at a cost of SR12.8 million (\$3.4 million).⁶³ The company may also soon be building infrared systems for Texas Instruments.⁶⁴

But a \$50 million contract is scarcely more than a symbolic gesture in comparison to the fact that the offset requirement for the 1992 F-15 deal alone totals \$3 billion. Saudi's offset conditions have been a real challenge to arms-makers in real years, as the Saudi industrial base is no where near the size necessary to absorb the quantity of business subscribed for it by arms contracts, nor is it technologically advanced enough to handle some of the sophisticated manufacturing techniques necessary to produce these multi-million dollar machines. In the recent past, the entire Saudi military industrial complex was confined to a small arms factory at El-Kharj

and some co-production deals with Brazil and Germany, neither of which involved aircraft.⁶⁵

The Saudis are presently attempting to concentrate on developing their aerospace and defense electronics firms. This effort has been largely conducted with the assistance of BITG, a group of companies including Boeing, ITT, Westinghouse, Saudi Amoudi Group and others who oversee the Peace Shield Investment Offset program. Besides AEC, other Saudi firms producing aerospace and defense electronic components and services under the BITG umbrella include the Aircraft Accessories and Components Company, International Systems and Engineering, and the Al-Salam Aircraft Company. These four companies sold over SR400 million (\$107 million) worth of products and services in 1993, and their employment rolls are 30% Saudi, which is considered a high percentage.⁶⁶

Joint Saudi-US weapons production will continue to be a crucial part of any future aircraft sales, but whether or not the budding Saudi arms industry will become a self-supporting success story or simply a diversion for offset requirements is less certain. Joint research is even less probable, but there is an unlikely but distinct possibility that an American aerospace company may seek some type of joint venture with a Saudi company or the Saudi government to help finance development of a new aircraft, even as France's Dassault sought Saudi backing for its Mirage 4000.⁶⁷

THE REAL THREAT?

If anything derails the current defense acquisition strategy of the Saudi royal family, it will not be because their basic strategy of arming with high-tech weaponry was erroneous. The greater danger at the present time is a collapse from within due neglected or uncounteracted internal pressures. The Saudis' massive expenditures on defense have not gone unnoticed by the Saudi populace. After the

"invasion" of the kingdom by thousands of friendly Western forces during Desert Storm, Saudi popular feeling called for a greater self-reliance in defense, but some citizens perceive that the country's current leadership is not up to the job. There are numerous reports that many Saudis believe that the royal family is out-of-touch with the general populace, often corrupt, and in cahoots with American defense companies eager to close large, lucrative contracts at the expense of the cash-crunched Saudi middle class.⁶⁸

The 7000 member royal family itself is split into competing factions, which are often unified only by their desire to keep governmental power in the Saud family. King Fahd is old and ailing, and could die, resign or be nudged out by royal consensus at any time, raising the possibility of a succession crisis. Saudi successions are rarely smooth, as the order of succession in the Saud family is not well-established. Since the death of Saudi Arabia founder Abdul al'Aziz, the throne has been held by four of his 37 sons. Although Crown Prince Abdullah will probably successfully inherit Fahd's throne, he, too, is old, as are most of his brothers. As the 25 remaining sons of Aziz die off or refuse the throne, power will eventually have to pass on to the much larger next generation. The scenarios at that point are endless, and the picture as a whole does not serve to depict to opponents a stable and long-lasting system of governance.

Islamic reformists currently are the most active opposition to the Sauds' reign, and have been the subject of a wide wave of arrests by Saudi internal forces. Mostly middle-class preachers, professors, and students from Saudi Arabia's religious universities, the ranks of these discontented Saudis number in the tens of thousands. Although the Saud family has taken care to try to preserve many Islamic aspects of Saudi society, these reformers question the Islamic legitimacy of the Saud family and the senior members of Saudi Arabia's well-entrenched religious establishment.

In a recent Middle East Journal article, Dekmejian identified several foreign and domestic catalysts of this Islamic upsurge, including declining living standards, socioeconomic inequity highlighted by urbanization, modernization, Western cultural influences, the outside threats of Iraq and Iran, the increasing momentum of Islamist movements throughout the Arab world, and "the contradictions between the kingdom's pro-Western orientation and its support of Islamism at home and abroad."⁶⁹ The Desert Storm conflict and the continued low price of oil has exacerbated all of these factors.

The London-based Committee for the Defense of Legitimate Rights in Saudi Arabia (CDLR) is the most active opposition group. Six prominent Islamists founded the CDLR in May of 1993 under the rubric of a human rights organization. The CDLR and other Islamic reformers have publicly called for the restoration of Islamic justice in Saudi government and society by eliminating nepotism, favoritism, and corruption, establishing consultative councils and an independent judiciary with real political power, reestablishing sharia (Islamic religious law) as the model for all Saudi laws and regulations, purging Western influences from the Saudi media and culture in general, building a strong army with equipment from diverse sources, and enacting a foreign policy more sensitive to Islamic concerns.⁷⁰ Until very recently, the CDLR has confined its criticisms to the Saudi regime and occasionally Israel, and has not tried to blame the US for Saudi internal problems. However, in March of 1995 the CDLR accused both the US and Israel of conspiring with the Saudi royal family to "liquidate" the opposition-an accusation more alarming from its anti-US overtones than its veracity.⁷¹

The Saudi government disbanded the CDLR and jailed spokesman Muhammad al-Mas'ari only two weeks after its inception. Mas'ari was freed six months later, slipped out of the kingdom in April of 1994, and traveled to London where he reestablished the

CDLR.⁷² The CDLR now directs domestic protests and mosque sit-ins from its foreign base, and also publicizes the shortcomings of the Saudi government.⁷³

The Saudi response to the Islamist challenge has been a mixture of acquiescence to Islamist demands, public warnings and disavowals of Islamist influence, police suppression, and patronage of rival groups such as liberal modernists, businessmen, and even the Shi'ites. So when King Fahd responded to public demand and finally formed a Consultative Council in August of 1993, its membership was largely Western-educated bureaucrats and academics with only a 10% representation by Islamic functionaries.⁷⁴

How much military expenditures feed fundamentalist and popular unrest is difficult to quantify, but there is no doubt one of the major platforms of the Islamic opposition is to eliminate overdependence on Western military imports. King Fahd certainly incurs a risk to his power by integrating himself more and more closely with the US military industrial base and the US government. Many arms-control experts have attempted to create a link between the downfall of the Shah and his massive arms imports from the US. The situation in Saudi Arabia differs from pre-Khomeini Iran in many significant ways,⁷⁵ and the comparison is too complex to discuss here, but the point remains there are social and economic costs to these arms imports which need to be evaluated.

One means of avoiding the political costs of buying American is to look for alternative sources. The US' two primary national competitors for Saudi military aerospace contracts are France and Great Britain. The following descriptions of these two countries' marketing efforts in the kingdom will complete this depiction of the current Saudi market.

FRANCE

The country of France exploits weapons deals for political as well as economic reasons; a major goal has been to strengthen French ties with oil-producing Arab states such as Saudi Arabia and Libya. Although De Gaulle's France strongly supported Israel during the early 1960s, by the end of that decade French foreign policy had taken a decidedly pro-Arab twist. In reward, Arab nations, including Saudi Arabia, readily stocked their armies, navies, and air forces with French equipment. In the 1970s, a full 33% of Saudi purchases originated from France, even though these weapons did not include aircraft.⁷⁶ In 1984, the Saudis ordered a \$4 billion air defense system from France in the largest single arms export deal in French history. Reportedly, the Saudis made the purchase from the French to balance their recent F-15 and AWACS purchases from the US.⁷⁷

In an interesting turn of events, it is now reported that France and Israel are planning to conduct a significant amount of joint R&D in their respective weapons development programs, which are quite complementary to each other both in technical expertise and in market access. The partnership, if successful, could potentially become a major force on the world market.⁷⁸ It remains to be seen if this rapprochement will have an effect on French sales to Arab nations, apparently the French believed the recent thawing in Palestinian-Israeli relations was permanent and sufficient enough to risk Arab criticism of French military involvement in Israel.

The French have experienced significant success in selling Saudi Arabia French-made ground and naval equipment. Nearly all of the ships currently on-order from the Saudi Arabian navy are being manufactured in France, possibly because the country's shipbuilding industry was better designed to produce the smaller vessels the Saudis' needs than US shipbuilders, who are more accustomed to constructing large, blue-water craft. The Saudi army also fields

French-built tanks, artillery, and other equipment. These huge sales notwithstanding, the French have not been able to break into the American/British lock on RSAF aircraft procurement.

In the Saudi military aerospace market, the Mirage 2000 lost out in competition to both the US-built F-15 and the Panavia Tornado, a development which has hurt Dassault's marketing momentum with its oncoming Rafale. The general weakness of the Mirage 2000 program may have demonstrated some technological deficiencies in the French aerospace industry. When the 2000 finally went into full-scale production in the early 1980s after repeated delays, its technology was equivalent to the US' F-16, already in production for ten years.⁷⁹

GREAT BRITAIN

As described above, the British inroads into the Saudi aerospace market have been centered around the al-Yamamah agreement. British aerospace dealings with Saudi Arabia have not always been golden contracts full of fat profits for the UK. The al-Yamamah agreement got off to a poor start as the first Tornados Panavia delivered to the RSAF did not operate as capably as promised. More difficulties were to follow. Weapons-for-oil barter specifications in the Al-Yamamah contract were complicated by the late 1980s drop in oil prices, and the terms had to be renegotiated. The 30 percent offset requirement of the contract had resulted in only one joint venture program by the first part of 1993;⁸⁰ the British have complained that many of the available investment opportunities had been already snapped up by the Americans.

The British have taken full responsibility for overseeing the training and support of the Saudi Tornado sale, and have earned a fairly good reputation for execution of that responsibility. Interestingly, the Tornado was developed with technology transferred under a licensing agreement with Lockheed.⁸¹

EUROPEAN PROSPECTS IN SAUDI ARABIA

The prospects for future sales of European military aircraft to Saudi Arabia are not bright, besides filling backorders from the al-Yamamah contract. In recent years, the RSAF has become more dependent than ever on the support of the US for the reliable operation of the equipment it already fields in its inventory. To procure a new major aerospace system at this point would overtask the kingdom's military and financial resources. The cost of cross-integrating of dissimilar European and American systems alone would be prohibitive. Most of the electronic equipment on RSAF US-built aircraft is designed to operate complementarily. To resynchronize an established set of electronic systems such as C3, radar, and communications is a very complicated task, and acts as a definite barrier to future aerospace purchases from outside the US. The fact that the US may acquire a degree of monopoly power over the aerospace marketplace as it continues to increase its share of the world market, especially in aerospace,⁸² may weaken even more the European leverage needed to crack open the door to the RSAF. Furthermore, American weaponry is perceived to be of the best quality-the Saudis were witnessed it prove its value in Desert Storm.

To pick the American lock on the Saudi military aerospace market will probably require a break in the political status quo, something similar to the political situation that Great Britain was able to exploit in 1985. The immediate likelihood for this to happen on the US side is low, as US congressional opposition to the sale of high-tech weapons to Saudi Arabia is no where near as formidable as it was during the 1970s and 1980s.

Perhaps the most promising opening for the Europeans is centered in the politics of Saudi Arabia, rather than in the US. The Europeans will need to try to capitalize on the professed Saudi

preference for a diversity of weapons suppliers. Although US congressional opposition was the occurrence that cracked the door for Great Britain to gain entrance to the Saudi aerospace market in the first place, there is no doubt that one of the driving factors behind the continuing profitability of al-Yamamah was the Saudis taking advantage of their ability to choose suppliers. Excessive dependence on the US military is definitely not the politically popular choice for the house of Saud.

European aerospace manufacturers also possess a perhaps temporary comparative advantage because their export controls are looser than the US, especially in the EW arena, where the US has concentrated export control on necessary software codes needed to direct aerospace electronics to operate at maximum capacity.⁸³ If the US Congress continues to limit the capabilities of US aircraft exported to Saudi Arabia, there is at least the potential that a European manufacturer could offer a more capable system and win a contract.

SUMMARY

Among arms trade analysts there is probably an overfocus on easily measurable indicators such as arms trade sum totals. Often the sheer sum of Saudi arms spending tends to outshine the fact that Saudi military development began from nearly nothing, and that the historical progression in their military development from Ikhwan warriors riding in the desert to one of the most advanced military forces in the developing world will obviously not come without a price. Indeed, spending large sums of money on high tech warfare can be considered a strategy in itself, albeit a high-cost one. The fact that you can outspend and out-equip your potential foe can act as an effective deterrent, many analysts believe such a strategy helped the US win the Cold War. At any rate, the strategic limitations of defending the

vast country of Saudi Arabia necessitate the employment of force-multiplying, high-tech weaponry.

Although some arms-trade analysts believe the Saudis' post-Gulf War arms buying binge served to escalate the Middle East arms race to a dangerously high level, it must be remembered that despite their high-tech military, the Saudi armed forces are very defensive in orientation, and are decades away from any capability to mount and maintain any sort of sustained offensive into a neighboring country, especially if the US were to withdraw its technical support.⁸⁴

Saudi Arabia does sometimes display a tendency to overextend itself by "'buying' off more than it can chew," but the most formidable challenges to the Saudis' developing their defensive military capability are internal - they must raise the professional and technical standards of their military personnel, employ better resource/fiscal management, improve cooperation and communication between services and other vertical structures (to include a more unified command structure), and continue to build on the foundation of experience that have gained over the past thirty years, expensive experience although it has been.

1 Plommer, Leslie. "Deserted by its Erstwhile Super-Riches, Saudi Arabia is Forced to Go to Work."

2 Evans, p. 13, Hartung, p. F13, Klare, American..., p. 11.

3 For in-depth analysis of Iranian support of Saudi fundamentalist opposition movements, see Defense & Foreign Affairs Strategic Policy. "Saudi Leaders Resist Islamist Pressures," p. 24.

4 Reported in Defense & Foreign Affairs Strategic Policy. "Saudi Leaders..." This is certainly an easily imaginable scenario.

5 Although Israel continues to officially deny it possesses nuclear weapons, it is taken for granted by most intelligence agencies that the country probably fields anywhere from 100-300 nuclear warheads, deliverable by both air and ballistic missile. Cordesman, Anthony J. After the Storm: The Changing Military Balance in the Middle East, p. 55.

6 A divided and thereby weakened Yemen has been a major Saudi foreign policy goal for decades. Rathmell, Andrew. "Saudi Arabia's Military Build-up- An Extravagant Error?"

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- 7 Economist Intelligence Unit, Saudi Arabia, p. 2.
- 8 Economist Intelligence Unit, p. 10.
- 9 Economist Intelligence Unit, p. 11. The Saudis' have a variety of potential reasons to inflate their population figures, to include appearing stronger to potential external enemies, to minimize the impact of a very large proportion of foreign workers, and to deflate the percentage of Saudi Shi'ite population, most of whom live in the country's Eastern province.
- 10 Cordesman, After the..., p. 555.
- 11 Several of these studies are discussed in length in Cordesman, Anthony J. The Gulf and the Search for Strategic Stability: Saudi Arabia, the Military Balance in the Gulf, and Trends in the Arab-Israeli Military Balance.
- 12 Pierre, Andrew. The Global Politics of Arms Sales, pp. 177-178.
- 13 Much to the Saudis' dismay, throughout the 1970s the US, as part of the Nixon/Kissinger "twin pillar" Gulf security model, promoted Iran as a potential savior for the Saudis if the kingdom was ever subject to a major invasion.
- 14 Rathmell.
- 15 Safran, Nadav. Saudi Arabia: The Ceaseless Quest for Security, p. 103.
- 16 The Saudi navy's most recent purchases have been almost exclusively of French origin.
- 17 For an explanation of "generic" competitive strategies, see Porter, The Comparative..., pp. 38-40.
- 18 Safran, p. 201.
- 19 Safran, p. 205.
- 20 Safran, p. 205.
- 21 McCormick, William. "Selected Military Transactions in the U.S. International Accounts, 1983-87," p. 71.
- 22 Morrocco, John D. "Saudi Restructures Arms Deals with U.S."
- 23 Aerospace Daily. "F-16 Seen in Running to Replace Saudi F-5Es."
- 24 Interview with Maj. Doug Fingles, USAF/AFSAT training manager for the F-15S.
- 25 Pierre, pp. 182-83.
- 26 Ferrari, p. 104.
- 27 Aerospace Daily. "Defense Contracts Awarded during Week of Feb. 7-11."
- 28 Pierre, p. 185.
- 29 Pierre, p. 179.
- 30 U.S. Department of Defense. Foreign Military Sales, Foreign Military Construction Sales and Military Assistance Facts, pp. 24-25.
- 31 Meed Middle East Business Weekly. "Al-Yamamah Agreement Raises UK Spirits; Sale of 48 Tornado to Saudi Arabia."
- 32 Schmidt.
- 33 Harrison, Michael. "Desert Riches in the other Al Yamamah; The Business of Politics."

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- 34 O'Sullivan, Edmund. "All that Glistens...; U.K. Aerospace Industry Marketing to Persian Gulf Countries."
- 35 O'Sullivan.
- 36 O'Sullivan.
- 37 Cordesman, The Gulf and..., p. 279.
- 38 Cordesman, The Gulf and..., p. 279.
- 39 Cordesman, The Gulf and..., pp. 315-317.
- 40 Joel Johnson of the AIA as cited by Horvitz.
- 41 Morrocco, John D. "U.S. Sets Configuration for Saudi F-15XP Aircraft."
- 42 The F-15I will not carry a US-made ECM package, but this is because Israel has the in-country capability to manufacture their own.
- 43 Cordesman, The Gulf..., p. 321.
- 44 Engelberg, Stephen. "U.S.-Saudi Deals in 90's Shifting Away from Cash Toward Credit."
- 45 Cited by Phillip Finnegan and Barbara Opall in "Saudi Arms Market Wanes; Short-term Delays are but Part of Dimming Sales Trend."
- 46 Saudi Economic Survey, "AEC to Make Jets Electronic Parts."
- 47 Saudi Economic Survey. "State Budget Calls for Expenditures of SR 150 Billion, Envisages Revenues at SR 135 Billion in New Year." Saudi Gazette. "Royal Decrees Issued on Budget Allocations."
- 48 Plommer.
- 49 Lopez, Ramon. "Pentagon Predicts Fall in Exports."
- 50 Sciolino and Schmitt.
- 51 Interview with Maj. Doug Fingles.
- 52 Engelberg.
- 53 Interview with Maj. Doug Fingles. The Saudi fiscal year begins in January.
- 54 Engelberg.
- 55 Finnegan and Opall. Also, Flight International. "F-15S Deliveries to Saudi Arabia Slow."
- 56 COMPASS Wire, Mar. 21, 1994. Cited by Federal News Service.
- 57 Flight International, "F-15S Deliveries..." Wall Street Journal cited as source.
- 58 Plommer.
- 59 Engelberg.
- 60 Morocco, "Saudi Restructures..."
- 61 In 1993, America imported 49.5% of its oil needs, setting a new record. Bard, Mitchell. "Buy now, pay whenever."
- 62 Reuters World Service. "Saudi Firm in F-15 Technology Transfer Deal." Riyadh Daily. "AEC, McDonnell Take Up New Tech Transfer Project."
- 63 Saberi, Mahmood. "Electronic Units for F-16 Fighting Falcons; AEC Bags Another Crucial Contract."
- 64 Saberi, Mahmood. "US Firm Proposes Production of Defence Equipment in Kingdom."

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- 65 Hussain, Nazir. Defense Production in the Muslim World: Limitations and Prospects, pp. 58-59.
- 66 Saudi Gazette. "4 Peace Shield Firms Record SR400m Sales."
- 67 The Mirage 4000 was specifically designed for export, as the French Air Force was not particularly interested in the model. Kolodziej, p. 276.
- 68 Murphy, Kim. "Running on Empty? With Oil Prices Down and Its Gulf War Debt, Some Doubt Saudi Arabia Can Go on Subsidizing Subjects' Cost of Living."
- 69 Dekmejian, R. Hrair. "Political Islamism in Saudi Arabia." pp. 630-631.
- 70 Dekmejian, p. 631.
- 71 COMPASS Newswire, reported on-line by the Mar. 31, 1995 MSANEWS.
- 72 Dekmejian, p. 639. Mas'ari is currently embroiled in a legal battle to obtain political refugee status in England. Sheikh Usama bin Ladin recently established another opposition group in London, named the Advice and Reformation Committee.
- 73 CDLR communiques are available on-line from the Muslim Student Association at Ohio State University, e-mail address msaosu@magnus.acs.ohio-state.edu.
- 74 Dekmejian, p. 639.
- 75 Unlike the current situation in Saudi Arabia, the Shah had both a secular middle class and the religious establishment united against him.
- 76 Kolodziej, p. 180.
- 77 Kolodziej, pp. 348-352.
- 78 Zakheim.
- 79 Kolodziej, pp. 198-199. The new Rafale will supposedly be more technologically advanced than the F-16s and F-18s currently in production, but not up to the level of the coming US-made F-22. Tirpak.
- 80 O'Sullivan.
- 81 Horvitz.
- 82 Kapstein claims that many economists believe a monopoly situation exists whenever a dominant firm controls over a third of the market, and is thus able to dictate its boundaries and norms.
- 83 Flight International. "Dressed to Defend."
- 84 As to length of the RSAF's ability to sustain a continued, large-scale offensive air operations without Western technical support, estimates vary between 2 days and 2 months.

Chapter 6:

SUMMARY

The sale of US-built military aircraft to Saudi Arabia in the long-term can continue to be a vital corridor by which the mutual interests of the US military aerospace industry, the US government, and the government of Saudi Arabia are satisfied in unique and important ways. The primary impulses which have sustained this arms supply relationship for thirty years are not only still present, but in many ways have deepened. The Saudis are still reliant on a high-tech air force for a viable national defense. The US uses an unprecedented amount of Saudi oil. The US military aerospace industry values Saudi Arabia as an important export customer more than ever.

Furthermore, some of the singular characteristics that distinguished these three parties from their peers have also intensified. Despite low growth in oil revenues, Saudi Arabia has remained one of the only developing countries who consistently exhibits a desire for large quantities of high tech American aircraft. The US government has become perhaps the only military power who could effectively and unilaterally defend the Saudis from a powerful foreign invader. The US aerospace military industry is still years ahead of its competitors in terms of technology and capability, although without industry vigilance and continued innovation this lead could be conceivably lost to European competitors in the future.

In the long term, the basic motivations driving the US-Saudi military relationship will probably remain the same. First of all, the strategic problems and relative strengths concerning the defense of Saudi Arabia will most likely not change. Saudi Arabia's population will still be low compared to her neighbors, and the country will remain the Gulf's leading oil producer and should probably continue

to have the economic resources to purchase high-tech weaponry. The US will still continue to consider the kingdom part of its "vital interests," and obviously this desert nation will retain its large, inhospitable, difficult-to-defend land mass. The US military and US arms companies will by necessity continue to be heavily involved in helping the RSAF integrate and implement its many advanced weapons systems, and will continue to help develop the fledgling Saudi defense industrial base.

The two weakest links in this arms-supply relationship are internal political opposition to the Saudi ruling family, and the uncertain outcome of the continued drawdown of the US military aerospace industry. Regardless of the outcome of Saudi political struggles or the aerospace industry rationalization, no major sales to the kingdom should be expected in the near future.

The balance of this summary will expand on these and other reasons why the long-term interests of Saudi Arabia and the US should continue to reinforce future sales of US military aircraft to Saudi Arabia. Included are some of the political considerations the two respective governments have needed to address in response to arms sales.

THE IMPORTANCE OF THE SAUDI MARKET TO THE US MILITARY AEROSPACE INDUSTRY AND TO THE US GOVERNMENT

The country of Saudi Arabia is an enormously important customer of US military aerospace products. The contraction of the worldwide defense industry has left the US with a large market share that is its only to lose if government and industry will not cooperate to maintain, nurture, and develop important export markets such as Saudi Arabia. The \$30 billion the kingdom has spent on American arms since 1990, of which an outsize portion has been aerospace

products, is close to the Pentagon's total procurement outlays for the entire FY 1993.¹ The sheer size and scope of Saudi aircraft purchases, combined with the shrinkage of the US military industrial base in the aftermath of the end of the Cold War, has made Saudi Arabia an important partner in the continued preservation of a viable US military aerospace production capability. Although it can be in no way claimed that the US is dependent on the Saudis for its own national security, it has become more than simply a matter of economic loss if the US were to lose Saudi Arabia as US military aircraft export customer; the event could have repercussions on the prosperity of an aerospace industry that is ultimately responsible for continuing US military superiority.

Due to the current downward slide of both the military and commercial purchasing cycles, aircraft makers are relying heavily on military exports to help carry them through present short-term difficulties.² The Saudi F-15S order alone has provided McDonnell Douglas a foundational contract that will help keep the once-ailing company healthy until the end of the decade, and may open up new possibilities for sale of an expensive aircraft whose production line would have otherwise been shut down. However, the Saudi contribution to the short-term health of the US military aerospace industry has definitely peaked. The current economic difficulties of the Saudi regime, compounded by the heightened internal and international scrutiny of Saudi fiscal management, will prohibit any future large military aircraft packages in the foreseeable future, excepting for the occurrence of another large-scale Gulf War.

Future US military aircraft may have to take into account the needs of important export customers such as Saudi Arabia throughout product development, perhaps even during the initial R&D stages. Peter Drucker has argued that national economies have become so subordinate to the global economy that the success of large businesses is largely dependent on their ability to acquire and

maintain a powerful international competitive advantage.³ In light of this, the US government will need to realize that in the future, national security permitting, it may need to temporarily restrain its procurement and political agendas in order to facilitate the aerospace industry's preservation of its world leadership position in the export market.

Political Considerations. The issue most often raised by the US Congress in objection to selling aircraft to the Saudis is that advanced Saudi weaponry could possibly constitute a threat to Israel. As a result of these concerns, congressionally-dictated specifications for Saudi aircraft have included measures to limit their range and electronics systems in order to prevent them from challenging Israel's military superiority in the region. Although Saudi Arabia has not been directly involved in armed conflict with Israel,⁴ the Arab-Israeli conflict has historically cast a shadow over Saudi-American relations. To the dismay of the Saudis, the state of Israel has enjoyed an enviable amount of support in the US Congress, and was and is the annual recipient of millions and sometimes billions of American dollars for purchase of American arms. Israel, with its frequent wars with Soviet-armed and Saudi-financed neighbors, has been considered by American defense officials and military officers as both a testing-ground and a showcase for American weapons in battle against Soviet-built weaponry. In addition, many US politicians have considered Israel a beacon for democracy in the Middle East. Jewish-Americans wield considerable influence in Washington, exercising leverage well beyond their numbers. The American Israel Public Affairs Committee (AIPAC) lobby successfully persuaded the US Congress to either block or modify several proposed arms sales to Saudi Arabia during the 1970s and 1980s. Most typically, a proposed sale of advanced equipment to Saudi Arabia is approved by Congress, but only after the administration agrees to sufficiently degrade the

equipment enough to satisfy Israeli-supporting Congressmen. This was the chain of events in the Carter F-15 sale, the Reagan AWACS sale, and the Bush F-15E sale.⁵ These modifications did not come without a political cost to the Israelis. AIPAC's and Israel's vehement opposition to proposed Saudi arms sales soured the country's diplomatic relationships with the Ford, Carter, and Reagan administrations.

Despite its legislative successes, AIPAC's influence upon Saudi arms transfers is not what it used to be. The now twenty-year-old coalition of weapons manufacturers, Arab-leaning diplomats, Pentagon officials, and pro-commerce Treasury, Commerce, and State Department bureaucrats that has supported Saudi arms sales seems to presently have gained the upper hand concerning the issue.⁶ The coalition's dollar-weighted arguments hold greater appeal to a cash-strapped Congress and administration than Israeli claims of imperilment, especially as Arab-Israeli tensions have slackened in recent years.

Another political aspect of arms transfers to Saudi Arabia that has generated congressional opposition is the incongruity of the attempt to form an intimate military relationship with a country that is so profoundly dissimilar to the United States. Unlike Israel with its democratic government, mostly free enterprise economic system, Western background of many of its citizens, Judaic heritage, and influential Jewish-American supporters, the gulf between the political systems, religion, and economic structure of the US and Saudi is very wide.⁷ In light of these dissimilarities, perhaps a military supply relationship is one of the best means for the US government to "get close" to a country that purposely attempts to maintain a proper distance as a means of satisfying the Islamic sensibilities of its population. Care must be taken to avoid appearances of a US dictation of Saudi foreign policy and a royal family reigning only due to the power of their American puppet-

masters. Arab journalists have recently accused the Saudis of allowing the US to exploit the "false threat" of Iraq and Iran to justify continued arms sales to the Gulf states.⁸

The sheer magnitude of arms transfers to Saudi Arabia has also been a key consideration by Congress, both as a positive and a negative factor. No country has come even close in the past two decades to matching the billions of dollars Saudi Arabia has spent on American weaponry. Nor has any developing country, with the exception of Israel, been given access to such a high level of sophisticated airborne and ground-based military systems as the Saudis. In the end, the magnitude in dollars is what eventually has reduced Congressional opposition to arms transactions to Saudi Arabia to scarcely a whimper. Congress has come to more dearly value Saudi purchases both as a job provider and a help to the US' chronic international trade deficit. The fact that many of the disasters predicted to befall the US after the mid-1980s AWACS sale never occurred also stifled criticism. The royal family has retained its power, Qadafi and the Russians have not gotten their hands on US aircraft, and no Americans in Saudi have become hostages.

One of the significant and often unappreciated aspects of the Saudi's military relationship with the US is that the country has not chosen as of yet to develop chemical, biological, and nuclear unconventional warheads, unlike its Middle East neighbors of Israel, Iraq, Iran, Syria, and Libya. The Saudis did purchase expensive DF-3 ballistic missiles from China from 1985-88 in response to the "War of the Cities" missile bombardments being exchanged at the time between Iraq and Iran during their conflict, but the warheads on these missiles were conventionally armed. Their military deterrent value is considered negligible-their use was scarcely considered during Desert Storm despite Iraqi SCUD attacks. At any rate, their life span is limited to 14 years after their rollout in 1983, due to the limited durability of some of their components. Without spare part

replacement, these missiles will be rendered useless before the turn of the century.⁹

A final political consideration that will probably take on new significance in the near future is the human rights situation in Saudi Arabia. The increase in Saudi repression of political opponents has already become more of a source of concern to US policy-makers than the Saudi contribution to Middle East arms proliferation. Saudi al-Mabahith al-'Ama (General Intelligence) security forces have arrested hundreds of Sunni Islamist activists over the past year. Amnesty International has recorded many reports of Saudi prisoners that have been tortured, mistreated, jailed without charges, and forbidden outside contact.¹⁰ Just what threshold of governmental repression the Saudis must cross before the US begins to seriously reconsider Saudi arms sales is unknown-the issue is certainly undefined by law. The Clinton administration has not of yet shown a tendency to strongly link foreign policy to human rights. However, if the Saudi opposition successfully publicizes Saudi abuses enough to initiate a worldwide media event, the situation could conceivably force the Clinton administration and/or Congress to take a more outward stance against Saudi internal policy. Historically, the US has taken care to avoid meddling with Saudi internal politics. Washington officials are already experiencing enough difficulty trying to predict the coming order of succession in the Saudi royal family.

A workable continuation of US exports to Saudi Arabia is totally dependent on a high level of mutual understanding between the two countries. The US can not afford to treat Saudi Arabia's oil wealth as an gigantic "cash cow" which will never run dry. The present budgetary difficulties and internal opposition facing the house of Saud has created a situation in which all future arms exports must take into account the direct and indirect internal costs to the Saudis, to include possible fundamentalist backlashes, diversion of development funds, and the perils of deficit spending, as well as traditional

strategic issues. On their part, the Saudis must understand the cyclical nature of the US aerospace industry and how its imports fit into the overall health of a benefactor industry, in addition to learning how to best employ the weaponry already in their inventory.

There is much debate on whether the continuing expansion of the Saudi military has catalyzed the expansion of the Middle East arms race and drained limited resources. The kingdom is often accused by Western and Eastern critics of fielding a hollow force, incapable of defending itself from the more populous countries of Iraq and Iran, and expending precious fiscal and political capital on foreign military equipment at the expense of needed internal economic development.¹¹ What are not so readily offered are viable alternatives for the house of Saud. No one can deny that an hugely expensive buildup of the military has its risks. But it must be remembered that both Iran and Iraq built militaries dwarfing the size of Saudi Arabia's long before the kingdom wielded any degree of real military strength.

THE IMPORTANCE OF US MILITARY AEROSPACE TO SAUDI ARABIA

The Saudis' options are limited if they wish to enhance their defensive capabilities. Defensive integration with their much smaller GCC neighbors to the extent where it could significantly assist Saudi security concerns is many years away, due to dissimilar weapons systems and various sovereignty questions. European experts claim that the integration of the various GCC weapons system's hardware alone would take up to 10 years and be prohibitively expensive.¹² The continuing Iran-UAE dispute over the Abu Musa and Tumbs islands and intra-GCC border conflicts make small-scale armed conflict in the Gulf more likely in the near future than significant and effective defense cooperation.

Strengthening economic and military bonds with the US makes sense, as the last remaining superpower has proven its willingness to come to the aid of the Saudis. If an interdependent relationship can be continued and nurtured by the Saudis, hopefully the Americans will be there again should trouble arise. Furthermore, in the long-term the US will remain as one of a very few nations capable of maintaining a defense industry endowed with the gigantic amounts of know-how and capital necessary to research, design, and develop new weapons systems as these systems grow increasingly more complex and expensive. Kapstein has argued that the US could potentially eventually monopolize some segments of the arms industry, as worldwide demand continues to shrink and costs rise.¹³ Saudi Arabia has an interest in maintaining a strong, mutually beneficial relationship with the strongest arms producer in the world, especially in the light that their strategic situation demands a high-tech military to mount a capable defense.

Political Considerations.

The primary impediment to continued military aircraft supply relationship between the US and Saudi Arabia is the influence of the Saudi Islamists, to include their possible rise to power. To successfully counter the internal pressures that have fueled the popularity of the Islamists, the Saud family must continue to attempt to balance the demands of the populace of its essentially welfare state with the need to develop its economy, improve its fiscal situation, and build a strong and effective military. The funds spent on the last will directly affect the ruler's ability to satisfy the populace in the former two categories. But the equation is not politically a one-for-one exchange even on this internal level. Having a strong military can politically legitimize the regime to many citizens. A continuing criticism of the royal family has been that they purposely keep the

Saudi armed forces weak and dependent on the West so as to prevent the military from becoming a rival power center.¹⁴

It is interesting to note that among the demands of the Saudi fundamentalists is a call for a stronger army, although they have not expanded their vision to the other two military branches of the air force and navy at this time. An Islamist Saudi government would not automatically negate the possibility of maintaining a long-term aerospace supply relationship with the US. The Islamists are very cognizant of the Iranian and Iraqi military threats, and strongly promote the ideal of a Saudi military fully capable of self-defense without embarrassing dependence on over-the-horizon assistance. The Saudi Islamists have expressed few communal feelings towards the Iranian fundamentalist government-more noticeable is a typical Saudi anti-Shi'ite bias which could serve to further aggravate Saudi-Iran relations. The form of a Saudi Islamist-US arms supply connection would rely on the state of political relations between the new regime and the US, and the identity and capabilities of the remaining arms suppliers, both dynamic circumstances which are difficult to accurately predict.

If the US-Saudi arms supply relationship is to remain in the same pattern as it is now, both the Saudi royal family and the US government, as the final authorities in the relationship, must take responsibility to insure that the full social and economic cost of any arms sale is considered before closure. The respective militaries of the two countries have an obvious motivation to make this arms affiliation work, as do the defense companies themselves. Joel Johnson of the Aerospace Industries Association (AIA) has stated "All the players have a strong desire to make this [the F-15 restructuring plan] work,. The Saudis want the systems, but they are also concerned about the US industrial base."¹⁵ Indeed, a concern for the health of the American aerospace industry played no small role in the Saudi decision to place its \$6 billion order for the upgrade of its national civil

air fleet entirely with the American firms of Boeing and McDonnell Douglas, instead of splitting the order with Europe's Airbus Industrie consortium, as originally planned.

The Clinton administration can be commended for recently discouraging the Saudi military from purchasing several weapons systems they requested, as part of a plan to help the Saudis pay for the weapons systems they already have on-order. Under this policy, reportedly about 15 export proposals by American arms companies have been turned down.¹⁶ The US must take a long-term position on arms sales to the Saudis, both in a strategic partnership role and in a customer-supplier relationship. Many defense officials realize this fact. US Assistant Secretary of Defense for International Security Affairs has stated, "This building [the Pentagon] has acted very responsibly in seeing itself as the protector of the Saudi alliance over the long term, rather than as an arms merchant in the short term."¹⁷ However, as the Pentagon attempts to influence the Saudis towards fiscal responsibility, other Clinton administration figures such as Commerce Secretary Ron Brown and the President himself, have repeatedly pressed the King Fahd and his ministers towards mega-deals such as the Saudi's \$4.1 billion agreement with AT&T to upgrade their telecommunication system, and the \$6 billion civilian airliner sale.¹⁸

A GLIMPSE OF THE FUTURE?

Assuming Saudi power remains in royal family hands, the \$6 billion sale of US-built airliners to be delivered to Saudia airlines over the next several years has perhaps given us a picture of future US military aerospace business in the Kingdom. The deal: 1) involved heavy lobbying by US government officials to close the sale, 2) demonstrated commercial-military aerospace interdependence, as the airliner deal was tied to the Pentagon's agreement to stretch out Saudi

payments for the 1992 F-15S deal, 3) overcame foreign competition, reportedly because US foreign policy was more sensitive to Saudi concerns, as France's recent overtures to Iraq was the reason Airbus was allotted no share of the purchase, contrary to original plans, and 4) involved special financing support from US agencies, in this case the US Export-Import bank, which is financing the airliner deal in the largest single transaction in its history.¹⁹

But the future could turn out quite differently. The increasing momentum of the Saudi opposition, royal disunity, and wide-ranging effects of the information revolution are actions that will produce reactions. Eventually, the Saudi rulers may have to give up some or all of their power to the Saudi people, somehow better legitimize themselves to the Saudi people, or increase the repressiveness of their state. The resulting turmoil between now and a resolution to Saudi political and economic problems will ensure that the short-term market for military aircraft in the kingdom will remain weak. The question remaining is what form the future Saudi government will take, and whether the Saudis will still want American aircraft in the long-term. Political scenarios for a future Saudi Arabia include the full retention of power by the royal family with an orderly or disputed succession of rulers, a complete takeover by the Islamists, or some sort of power-sharing agreement between the royal family and the Islamists and/or liberal reformers. Regardless of who assumes power, the previously described long-term strategic concerns and constraints will most likely remain. Future Saudi purchases of US military aircraft may actually center around whether or not the US is able to build on its national competitive advantage in the industry, which could make alternative sourcing for Saudi aircraft an unwise choice for even a fundamentalist regime.

¹ Engelberg.

² Flannery, William. "McDonnell's CEO Gives Inside Look at What's Ahead."

³ Drucker, pp. 3, 17.

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- 4 The only exception was a small contingent of Saudi troops peripherally
involved in the initial 1948 Arab-Israeli war.
- 5 Spiegel, Steven L. The Other Arab-Israeli Conflict, p. 409.
- 6 This coalition is described in Spiegel, p. 310.
- 7 Spiegel has suggested that Israel's democratic system provided their diplomats
with a better understanding of US politics than their Arab counterparts. Spiegel,
p. 9.
- 8 "US Accused of Exploiting "False Threat" of Iraq and Iran to Milk GCC
coffers," Mideast Mirror, Mar. 20, 1994, in Mar. 30, 1995 from MSANEWS.
Available: msaosu@magnus.acs.ohio-state.edu.
- 9 Di, Hua. "China's Case: Ballistic Missile Proliferation," in The International
Missiles Bazaar: The New Suppliers' Network, ed. by William C. Potter and
Harlan W. Jencks. p. 172.
- 10 "Amnesty International....on Saudi Arrests," in MSANEWS, Oct. 17, 1994.
Available: msaosu@magnus.acs.ohio-state.edu.
- 11 Rathmell.
- 12 Fouad, Ashraf. "Arab Gulf Military Integration Moving Slowly."
- 13 Kapstein.
- 14 Abir, Mordechai. Saudi Arabia: Government, Society and the Gulf Crisis, p.
157.
- 15 Quoted by Finnegan and Opall.
- 16 Sciolino and Schmitt.
- 17 Sciolino and Schmitt.
- 18 Sciolino and Schmitt.
- 19 Friedman, Thomas L. "Saudi Air to Buy \$6 Billion in Jets Built in the US."

APPENDIX



United States of America
Letter of Offer and Acceptance (LOA)

SR-D-SRC

Based on RSAF/CC Ltr, 22 Oct 91.

Pursuant to the Arms Export Control Act, the Government of the United States (USG) offers to sell to the Government of Saudi Arabia, Royal Embassy of Saudi Arabia, 2109 I Street, N.W., Washington, D.C. 20037, the defense articles or defense services (which may include defense design and construction services) collectively referred to as "items", set forth herein, subject to the provisions, terms, and conditions in this LOA.

This LOA is for F-15S Aircraft, support items, and services. Per RSAF request, this "RESTATED" LOA incorporates AIM-7M, AIM-9S, SDAF equipment, Pen and Ink Changes, and reduced overall case value.

Estimated Cost: \$9,000,000,000 Initial Deposit: \$0
Terms of Sale: Cash Prior to Delivery
Dependable Undertaking
Congressional Notification: 92-42

This offer expires on 06 May 1993. Unless a request for extension is made by the Purchaser and granted by the USG, the offer will terminate on the expiration date.

This page through page 51 plus Letter of Offer and Acceptance Standard Terms and Conditions attached, are a part of this LOA.

The undersigned are authorized representatives of their Governments and hereby offer and accept, respectively, this LOA:

Joseph F. ...
Brigadier General, USAF
Asst Dep Under Secretary of the Air Force
International Affairs
Typed Name and Title

5 MAY 1993
RHH ...
THE SEC. DEPUT. PREM. & MIN. OF DEF.
& AVIN. & INSP. GEN.
Typed Name and Title

SAP/IA

THE KINGDOM OF SAUDI ARABIA

...
Office of the Comptroller



Information to be provided by the Purchaser:

Mark For Code _____, Freight Forwarder Code _____, _____
Code _____, Name and Address of the Purchaser's Paying Office: _____

Explanations for acronyms and codes, and financial information, may be found in attached "Letter of Offer and Acceptance Information."

Items to be Supplied (costs and months for delivery are estimates):

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM	DESCRIPTION/CONDITION	QTY.	COSTS	SCAMOS/	OFFR	DEL
NBR		UNIT OF		TA OR	REL	TRM
		ISSUE	(\$/UNIT)	NOTE	CDE	CDE
001						
thru items as shown on succeeding pages.						
999						

Summary

Subtotal Cost of Ordered Articles and Services	\$ 8,671,565,254
Case/Program Management	\$ 51,159,191
Program Reserve	\$ 10,000,000

(8) Net Estimated Cost	\$ 8,732,724,445
(9) Packing, Crating, and Handling (See P. 12)	\$ 193,407
(10) Administrative Charge (See P. 12)	Std \$ 257,971,626
	Non-Std \$ 3,625,555
(11) Transportation (See P. 12)	\$ 5,484,967
(12) Other	\$ 0
(13) Total Estimated Cost	\$ 9,000,000,000

To assist in fiscal planning, the USG provides the following anticipated costs of this LOA:

Estimated Payment Schedule

Payment Date	Quarterly	Cumulative
Initial Deposit, LOI	\$ 195,597,900 (PAID)	\$ 195,597,900
Initial Deposit, LOA	\$ 0	\$ 195,597,900
15 Mar 94	\$ 22,802,100	\$ 218,400,000
15 Jun 94	126,200,000	344,600,000
15 Sep 94	209,100,000	553,700,000
15 Dec 94	312,000,000	865,700,000
15 Mar 95	402,500,000	1,268,200,000
15 Jun 95	510,800,000	1,779,000,000
15 Sep 95	586,200,000	2,365,200,000
15 Dec 95	641,000,000	3,006,200,000
15 Mar 96	623,700,000	3,629,900,000
15 Jun 96	653,900,000	4,283,800,000
15 Sep 96	651,700,000	4,935,500,000
15 Dec 96	675,000,000	5,610,500,000
15 Mar 97	648,300,000	6,258,800,000

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<u>Payment Date</u>	<u>Quarterly</u>	<u>Cumulative</u>
15 Jun 97	616,500,000	6,875,300,000
15 Sep 97	582,700,000	7,458,000,000
15 Dec 97	496,100,000	7,954,100,000
15 Mar 98	395,300,000	8,349,400,000
15 Jun 98	283,700,000	8,633,100,000
15 Sep 98	213,700,000	8,846,800,000
15 Dec 98	96,000,000	8,942,800,000
15 Mar 99	44,000,000	8,986,800,000
15 Jun 99	10,000,000	8,996,800,000
15 Sep 99	3,200,000	9,000,000,000

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(1) ITM NBR	(2) DESCRIPTION/CONDITION	(3) QTY. UNIT OF ISSUE	(4) COSTs		(5) SCAMOS/ TA OR NOTE	(6) OPR REL CDE	(7) DEL TRM CDE
			(A)UNIT	(B)TOTAL			
001 (D1) (47)	(A1F)15100000F155 (Y) AIRCRAFT FIGHTER F-155 F155 with F100-PW-229 Engines.	72 EA	843,043,841.99	84,339,156,624	P(28-65) TAS	X	10
002 (D1) (47)	(H6A)5865002093942 (N) AN/ALQ-135 ECM JAMMER ECJ Group B, Low Band System			8198,400,000	P(48-72) TAS	--	--
003 (D1) (47)	(P18)0000000000P18 (N) ACT WEAPONS CERTIFICATION Flight Test/Integration, and RSAT unique equipment.			850,000,000	P(36-72) TAS	--	--
004 (B1) (47)	(A9C)9A9C00ACPARTS (N) IA/C COMP, PARTS, ACCESSYS Aircraft			9944,502,400	X(1-72) TAS	A	4
005 (B1) (47)	(A7A)4920000001A7A (N) GROUND HANDLING EQUIP -INT INCLUDES COMP - SP Aircraft a. SUBLINE: Standard b. SUBLINE: Developmental			8274,524,113 (LINE TOTAL)			
				870,829,700	X(3-72) TAS	A	4
				8203,694,413	P(12-72) TAS	A	4
006 (D1) (47)	(J8A)7682800KSPUBS (N) TECH, NON-TECH BOOKS, PUBS Aircraft Country Std T.O.s (With F100-PW-229)			867,802,000	P(24-72) TAS	A	4
007 (D1) (47)	(R9A)079100AVS0FTS (N) AVIONICS SOFTWARE SUPPORT OPF Updates			840,000,000	P(32-72) TAS	--	--
008 (D1) (47)	(A9B)2840F100PW229 (Y) ENGINE JET F100-PW-229 Spare Engines	10 EA	85,039,999.99	830,400,000	P(24-48) TAS	A	4

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Bibliography

- Abir, Mordechai. Saudi Arabia: Government, Society and the Gulf Crisis, London: Rutledge, 1993.
- Acohido, Byron. "Analysis-What Did Saudi Deal Cost Boeing?-Did Aerospace Giant Offer Big Discounts, Exchange Jet Models to Land Offers?" The Seattle Times, May 7, 1994, p. D1. Available: NEXIS Library: NEXIS File: CURNWS.
- Aerospace Daily. "Defense Contracts Awarded during Week of Feb. 7-11," Feb. 15, 1994, p. 250. Available: NEXIS Library: NEXIS File: CURNWS.
- Aerospace Daily. "F-16 Seen in Running to Replace Saudi F-5Es," Feb. 24, 1994, p. 295. Available: NEXIS Library: NEXIS File: CURNWS.
- Aerospace Daily. "Lockheed Quotes Fixed Price for F-16 to Grease 'in Kind' Replacement," Jul 7, 1994, p. 23. Available: NEXIS Library: NEXIS File: CURNWS.
- Aerospace Daily. "Lockheed Planning to Shift to More Capable 'F-16X;' Exports Planned First," Jul. 8, 1994, p. 31. Available: NEXIS Library: NEXIS File: CURNWS.
- Aerospace Daily. "Pentagon's Top 500 RDT&E Contractors," Jun. 20, 1994, p. 449. Available: NEXIS Library: NEXIS File: CURNWS.
- Aerospace Daily. "Sale of F-15Is formally proposed to Congress," Apr. 12, 1994, p. 58. Available: NEXIS Library: NEXIS File: CURNWS.
- Aerospace Industries Association. Aerospace Facts & Figures: 1992-1993, Washington: AIA, 1992.
- Anthony, Ian and Herbert Wulf. "The Economics of the West European Arms Industry." In Restructuring of Arms Production in Western Europe, ed. by Michael Brzoska and Peter Lock, Oxford: Oxford University, 1992, pp. 17-35.

- Armstrong, C. Michael. "Reinventing Government-Industry Relations: Facts of Global Life." Speech delivered at MICOM Advance Planning Briefing for Industry, Nov. 9, 1993. In Vital Speeches, Mar. 15, 1994, p. 339. Available: NEXIS Library: NEXIS File: CURNWS.
- Augustine, Norman. "Future of the Defense Industry." Speech given at the National Press Club, Jun. 7, 1994. Federal News Service. Available: NEXIS Library: NEXIS File: CURNWS.
- Austin, James E. Managing in Developing Countries: Strategic Analysis and Operating Techniques, Free Press: New York, 1990.
- Bard, Mitchell. "Buy now, pay whenever," The Jerusalem Post, Apr. 19, 1994, p. 6. Available: NEXIS Library: NEXIS File: CURNWS.
- Bernstein, James. "Caporali Joins the Board of Merged Firm," Newsday, Jun. 16, 1994, p. A49. Available: NEXIS Library: NEXIS File: CURNWS.
- Betts, Paul. "Fighting Fit and Looking for Aerospace Deals-McDonnell Douglas is Emerging from a Harsh Restructuring with its Focus Sharpened," May 6, 1994, p. 26.
- Bloomberg Business News. "Company News: Lockheed is Indicted on Fee in Egypt Deal," The New York Times, Jun. 24, 1994, p. D5. Available: NEXIS Library: NEXIS File: CURNWS.
- Bluestone, Barry, Peter Jordan, and Mark Sullivan. Aircraft Industry Dynamics: An Analysis of Competition, Capital, and Labor, Boston: Auburn House, 1981.
- Business Wire. "Lockheed Corp. Cites Strong Performance of Fort Worth Co. on First Anniversary of Acquisition," Mar. 15, 1994. Available: NEXIS Library: NEXIS File: CURNWS.
- Cordesman, Anthony J. After the Storm: The Changing Military Balance in the Middle East, Boulder: Westview, 1993.
- _____. The Gulf and the Search for Strategic Stability: Saudi Arabia, the Military Balance in the Gulf, and Trends in the Arab-Israeli Military Balance, Boulder: Westview, 1984.

Dallas Morning News, "Most Industries Expect 2nd-Quarter Improvement," Jul. 5, 1994, p. 50. Available: NEXIS Library: NEXIS File: CURNWS.

Defense & Foreign Affairs Strategic Policy. "Saudi Leaders Resist Islamist Pressures," Oct. 31, 1994, p. 24. Available: NEXIS Library: NEXIS File: CURNWS.

Defense News. "Northrop Wins Contract for USAF F-15 Radars," May 16/22, 1994, p. 14. Available: NEXIS Library: NEXIS File: CURNWS.

Dekmejian, R. Hrair. "Political Islamism in Saudi Arabia," Middle East Journal, Autumn 1994, p. 627.

Di, Hua. "China's Case: Ballistic Missile Proliferation," in The International Missiles Bazaar: The New Suppliers' Network, ed. by William C. Potter and Harlan W. Jencks, Boulder: Westview, 1994.

Doz, Yves. "International Industries: Fragmentation versus Globalization," in Global Strategic Management: The Essentials, ed. by Heidi Vernon-Wortzel and Lawrence H. Wortzel, New York: Wiley, 1990, pp. 18-34.

Drucker, Peter F. "The Changed World Economy," in Global Strategic Management: The Essentials, ed. by Heidi Vernon-Wortzel and Lawrence H. Wortzel, New York: Wiley, 1990, pp. 3-18.

Economist Intelligence Unit, Saudi Arabia, London, 1994.

Ellis, James E.. "McDonnell Douglas: Unfasten the Seat Belts," Business Week, Feb. 14, 1994, p. 36. Available: NEXIS Library: NEXIS File: CURNWS.

Engelberg, Stephen. "U.S.-Saudi Deals in 90's Shifting Away from Cash Toward Credit," New York Times, Aug. 23, 1993, p. A1. Available: NEXIS Library: NEXIS File: CURNWS.

Evans, David. "Wounded Defense Industry Sets Its Sights Abroad," Business and Society Review, Winter 1994, p. 13.

Federal News Service. "Saudi Arabia Negotiating Loans with U.S. Banks," Mar. 21, 1994. Available: NEXIS Library: NEXIS File: CURNWS.

Ferrari, Paul L., Jeffrey W. Knopf and Raul L. Madrid. U.S. Arms Exports: Policies and Contractors, Washington D.C.: Investor Responsibility Research Center, 1987.

Finnegan, Philip. "McDonnell Once Again Tops DoD Contractors: Lockheed Moves Up to No. 2 Position; GE, Boeing Fell from Top 10 Rankings," Defense News, May 16/22, 1994, p. 25. Available: NEXIS Library: NEXIS File: CURNWS.

_____ and Barbara Opall. "Saudi Arms Market Wanes; Short-term Delays are but Part of Dimming Sales Trend," Defense News, Jan. 10, 1994, p. 1. Available: NEXIS Library: NEXIS File: CURNWS.

Flannery, William. "McDonnell's CEO Gives Inside Look at What's Ahead," St. Louis Post-Dispatch, Feb. 7, 1994, p. 13. Available: NEXIS Library: NEXIS File: CURNWS.

_____ "McDonnell Cruising Atop Defense World," St. Louis Post-Dispatch, Jun. 6, 1994, p. 12 business section. Available: NEXIS Library: NEXIS File: CURNWS.

_____ "Top Guns: Lockheed Overtakes McDonnell to Become No. 1 Defense Firm," St. Louis Post-Dispatch, Jul. 21, 1994, p. 1C. Available: NEXIS Library: NEXIS File: CURNWS.

Flight International. "Combat Electronics," Feb. 2, 1994. Available: NEXIS Library: NEXIS File: CURNWS.

Flight International. "Dressed to Defend," Mar. 2, 1994. Available: NEXIS Library: NEXIS File: CURNWS.

Flight International. "F-15S Deliveries to Saudi Arabia Slow," Feb. 9, 1994. Available: NEXIS Library: NEXIS File: CURNWS.

Flight International. "Re-newing the Hornet," Feb. 16, 1994. Available: NEXIS Library: NEXIS File: CURNWS.

- Fouad, Ashraf. "Arab Gulf Military Integration Moving Slowly," Reuters World Service, Dec. 6, 1994. Available: NEXIS Library: NEXIS File: CURNWS.
- Friedman, Thomas L. "Saudi Air to Buy \$6 Billion in Jets Built in the US," New York Times, Feb. 17, 1994, p. A1. Available: NEXIS Library: NEXIS File: CURNWS.
- Fulghum, David. "Surplus Sales Seen Funding New Buys," Aviation Week & Space Technology, Feb. 14, 1993, p. 20.
- Goodwin, Jacob. Brotherhood of Arms: General Dynamics and the Business of Defending America, New York: Times, 1985.
- Grimmett, Richard F. Trends in Conventional Arms Transfers to the Third World, Washington D.C.: Congressional Research Service, 1988.
- Gunston, Bill. World Encyclopaedia of Aircraft Manufacturers: From the Pioneers to the Present Day, Annapolis: Naval Institute, 1993.
- Hage, David. "Washing Away the Pain," U.S. News & World Report, Feb. 7, 1994, p. 47. Available: NEXIS Library: NEXIS File: CURNWS.
- Hamashige, Hope. "Southland Defense Contractors May Get Export Relief," Los Angeles Business Journal, Jun. 6, 1994, p. 29. Available: NEXIS Library: NEXIS File: CURNWS.
- Hammond, Paul Y., David J. Louscher, Michael D. Salomone, Norman A. Graham. The Reluctant Supplier: U.S. Decisionmaking for Arms Sales, Cambridge: Oelgeschlager, Gunn & Hain, 1983.
- Harrison, Michael. "Desert Riches in the other Al Yamamah; The Business of Politics," Evening Standard, Nov. 15, 1994, pp. 36-37. Available: NEXIS Library: NEXIS File: CURNWS.
- Hartung, William D. "The Phantom Profits of the War Trade," New York Times, Mar. 6, 1994, p. F13.
- Hayward, Keith. The World Aerospace Industry: Collaboration and Competition, London: Duckworth & RUSI, 1994.

- Horvitz, Leslie Alan. "The World Gorges at the Arms Cornucopia," The Washington Times, Dec. 12, 1994, p. 6. Available: NEXIS Library: NEXIS File: CURNWS.
- Hussain, Nazir. Defense Production in the Muslim World: Limitations and Prospects, Karachi: Royal, 1989.
- Isenberg, David. "Desert Storm Redux?" Middle East Journal, Summer 1993, Vol. 47, No. 3, p. 429.
- Kapstein, Ethan B. "America's Arms-Trade Monopoly; Lagging Sales Will Starve Lesser Suppliers," Foreign Affairs, May/June 1994, p. 13. Available: NEXIS Library: NEXIS File: CURNWS.
- Klare, Michael T. American Arms Supermarket, Austin: University of Texas, 1984.
- Klare, Michael T. "The Arms Race: U.S. Must Exert Some Control Over Technology It Exports," The Ottawa Citizen, Mar. 15, 1994, p. A11. Available: NEXIS Library: NEXIS File: CURNWS.
- Kolodziej, Edward A. Making and Marketing Arms: The French Experience and Its Implications for the International System, Princeton: Princeton University, 1987.
- Kresa, Kent. "Northrop Grumman Corporation's CEO Speech to Shareholders," PR Newswire, May 18, 1994. Available: NEXIS Library: NEXIS File: CURNWS.
- Laurance, Edward J. The International Arms Trade, New York: Lexington, 1992.
- Levitt, Theodore. "The Globalization of Markets," in Global Strategic Management: The Essentials, ed. by Heidi Vernon-Wortzel and Lawrence H. Wortzel, New York: Wiley, 1990, pp. 307-318.
- Lopez, Ramon. "Pentagon Predicts Fall in Exports," Flight International, May 18, 1994. Available: NEXIS Library: NEXIS File: CURNWS.
- Louscher, David J. and Michael D. Salomone, eds. Marketing Security Assistance: New Perspectives on Arms Sales, Washington D.C.: Lexington, 1987.

- McCormick, William. "Selected Military Transactions in the U.S. International Accounts, 1983-87," Survey of Current Business, Jun. 1988, p. 70.
- McVitie, Doug. "FLA Flap Threatens to Isolate British," Defense News, Jun. 27, 1994, p. 23. Available: NEXIS Library: NEXIS File: CURNWS.
- Mecham, Michael. "U.S. Support for Saudi AWACS Called Crucial to Future Sales," Aviation Week & Space Technology, May 16, 1988, p. 24.
- Meed Middle East Business Weekly. "Al-Yamamah Agreement Raises UK Spirits; Sale of 48 Tornado to Saudi Arabia," Feb. 12, 1993, p. 29. Available: NEXIS Library: NEXIS File: CURNWS.
- Mintz John. "GAO Report Critical of Military 'Offsets'; Agency Urges End to Contract Quid Pro Quo," Washington Post, Jun. 22, 1994, p. F4. Available: NEXIS Library: NEXIS File: CURNWS.
- . "U.S., Contractors in Dogfight Over MiG Modernization," Washington Post, Jun. 14, 1994, p. D1. Available: NEXIS Library: NEXIS File: CURNWS.
- Morocco, John D. "Saudi Restructures Arms Deals with U.S.," Aviation Week & Space Technology, Feb. 7, 1994, p. 22. Available: NEXIS Library: NEXIS File: CURNWS.
- . "U.S. Sets Configuration for Saudi F-15XP Aircraft," Aviation Week & Space Technology, Sept. 21, 1992, p. 26. Available: NEXIS Library: NEXIS File: CURNWS.
- Murphy, Kim. "Running on Empty? With Oil Prices Down and Its Gulf War Debt, Some Doubt Saudi Arabia Can Go on Subsidizing Subjects' Cost of Living," Dallas Morning News, Jan. 8, 1995, p. 1A. Available: NEXIS Library: NEXIS File: CURNWS.
- Murphy, Paul. "Lay Down your Arms Debt," The Banker, Oct. 1988, p. 36.
- Napier, David H. "Year-End Review...and a Look Ahead," Aerospace America, Apr. 1994, p. 8. Available: NEXIS Library: NEXIS File: CURNWS.

- Nicholson, Brian D. Government Market Analysis for the Defense Industries, Professional Report, 1985.
- Opall, Barbara. "U.S. Industry Pushes Export Finance Fund," Defense News, Feb. 14, 1994, p. 6. Available: NEXIS Library; NEXIS File: CURNWS.
- O'Sullivan, Edmund. "All that Glistens...; U.K. Aerospace Industry Marketing to Persian Gulf Countries," MEED Middle East Business Weekly, Feb. 12, 1993, p. 5. Available: NEXIS Library; NEXIS File: CURNWS.
- Peacock, Lindsay. The World's Air Forces, London: Salamander, 1991.
- Pierre, Andrew. The Global Politics of Arms Sales, Princeton: Princeton University, 1982.
- Pinkas, Alon. "Senior Lockheed officials to Present F-16ES Proposal to Air Force," The Jerusalem Post, Jan. 12, 1994, p. 2. Available: NEXIS Library; NEXIS File: CURNWS.
- Plommer, Leslie. "Deserted by its Erstwhile Super-Riches, Saudi Arabia is Forced to Go to Work," The Guardian, Dec. 12, 1994, p. 12. Available: NEXIS Library; NEXIS File: CURNWS.
- Porter, Michael E. "Changing Patterns of International Competition," in Global Strategic Management: The Essentials, New York: Wiley, 1990, pp. 111-135.
- Porter, Michael E. The Competitive Advantage of Nations, New York: Free Press, 1990.
- Randal, Jonathan C. "British Weapons Sales Spur Controversy," The Washington Post, Mar. 25, 1989, p. A16. Available: NEXIS Library; NEXIS File: CURNWS.
- Rathmell, Andrew. "Saudi Arabia's Military Build-up - An Extravagant Error?" Jane's Intelligence Review, Nov. 1, 1994, p. 500. Available: NEXIS Library; NEXIS File: CURNWS.
- Remez, Michael. "Pratt Aided Overpricing Scheme, Report Says," The Hartford Courant, Oct. 27, 1993, p. A1. Available: NEXIS Library; NEXIS File: CURNWS.

Reppy, Judith. "The United States: Unmanaged Change in the Defence Industry," in Arms Industry Limited, ed. by Herbert Wulf, Oxford: Oxford University, 1993, pp. 50-65.

Reuters World Service. "Saudi Firm in F-15 Technology Transfer Deal," Mar. 31, 1994. Available: NEXIS Library: NEXIS File: CURNWS.

Ricks, Thomas E. "Pentagon Considers Selling Overseas a Large Part of High-Tech Weaponry," Wall Street Journal, Feb. 14, 1994. Available: NEXIS Library: NEXIS File: CURNWS.

Riyadh Daily. "AEC, McDonnell Take Up New Tech Transfer Project," cited in Mar. 31, 1994 Moneyclips. Available: NEXIS Library: NEXIS File: CURNWS.

Saberi, Mahmood. "Electronic Units for F-16 Fighting Falcons; AEC Bags Another Crucial Contract," Saudi Gazette, Apr. 4, 1994, quoted in Moneyclips. Available: NEXIS Library: NEXIS File: CURNWS.

_____. "US Firm Proposes Production of Defence Equipment in Kingdom," Saudi Gazette, Dec. 1, 1994. Available: NEXIS Library: NEXIS File: CURNWS.

Safran, Nadav. Saudi Arabia: The Ceaseless Quest for Security, Cambridge: Belknap, 1985.

Sarkar, Salil. "Big is Beautiful for Arms Makers," Business Times, Dec. 13, 1994, p. 19. Available: NEXIS Library: NEXIS File: CURNWS.

Saudi Economic Survey, "AEC to Make Jets Electronic Parts," Apr. 6, 1994, quoted in Moneyline. Available in NEXIS Library: NEXIS File: CURNWS.

Saudi Economic Survey, "State Budget Calls for Expenditures of SR 150 Billion, Envisages Revenues at SR 135 Billion in New Year," Jan. 4, 1995. Available: NEXIS Library: NEXIS File: CURNWS.

Saudi Gazette. "4 Peace Shield Firms Record SR400m Sales," Apr. 6, 1994, quoted in Moneyclips. Available: NEXIS Library: NEXIS File: CURNWS.

Saudi Gazette. "Royal Decrees Issued on Budget Allocations," Jan. 4, 1995. Available: NEXIS Library: NEXIS File: CURNWS.

Schine, Eric. "Cuts Won't Cut It Anymore," Business Week, Jan. 10, 1994, p. 72. Available: NEXIS Library: NEXIS File: CURNWS.

Schmidt, William E. "British to Sell Saudis Warplanes and Supplies Worth \$7.5 Billion," New York Times, Jan. 30, 1993, p. I3.

Sciolino, Elaine, with Eric Schmitt. "Chilly Partners--A Special Report..." The New York Times, Nov. 4, 1994, p. A1. Available NEXIS Library: NEXIS File: CURNWS.

Snider, Lewis, W. "Do Arms Exports Contribute to Savings in Defense Spending? A Cross-Sectional Pooled Time Series Analysis," in Marketing Security Assistance: New Perspectives on Arms Sales, ed. by David J. Louscher and Michael D. Salomone, Lexington: D.C. Heath, 1987, p. 41-63.

Sparaco, Pierre, and Carole A. Shifron. "Europe Faces Turmoil as Privatization Stalls," Aviation Week & Space Technology, May 30, 1994, p. 61. Available: NEXIS Library: NEXIS File: CURNWS.

Spiegel, Steven L. The Other Arab-Israeli Conflict. Chicago: University of Chicago, 1985.

Tirpak, John. "World Market Forces Improved Military Exports," Aviation Week & Space Technology, Feb. 14, 1994, p. 55. Available: NEXIS Library: NEXIS File: CURNWS.

Todd, Daniel. Defence Industries: A Global Perspective, London: Routledge, 1988.

U.N. Department for Disarmament Affairs. Study on Conventional Disarmament, New York: United Nations, 1985.

U.N. Office for Disarmament Affairs. The United Nations Disarmament Yearbook, New York: United Nations, 1993.

U.S. Arms Control and Disarmament Agency. World Military Expenditures and Arms Transfers 1993, Washington D.C.: GPO, 1994.

- U.S. Department of Defense. Foreign Military Sales, Foreign Military Construction Sales and Military Assistance Facts, Washington D.C.: U.S. Department of Defense, 1992.
- U.S. Department of State. Registration: The First Step in Defense Trade, Washington D.C.: U.S. Department of State, 1994.
- U.S. Department of State. Security and Arms Control: The Search for a More Stable Peace, Washington D.C.: U.S. State Department, 1983.
- Vadas, David. "US Aerospace Industry's Troubles Continue," Aerospace America, Jan. 1995, p. 14. Available: NEXIS Library: NEXIS File: CURNWS
- Vartabedian, Ralph and John M. Broder, "U.S. Weighs New Arms Sales Policy," Los Angeles Times, Nov. 15, 1994, p. A1. Available: NEXIS Library: NEXIS File: CURNWS.
- Velocci, Anthony L. "Defense Firms Show Financial Prowess," Aviation Week & Space Technology, May 30, 1994, p. 40. Available: NEXIS Library: NEXIS File: CURNWS.
- Walker, Karen. "A Friend in Need?" Flight International, May 11, 1994. Available: NEXIS Library: NEXIS File: CURNWS.
- Warwick, Graham. "Combat Electronics," Flight International, Feb. 2, 1994. Available: NEXIS Library: NEXIS File: CURNWS.
- Welch, Lawrence S. and Reijo Luostarinen. "Internationalization: Evolution of a Concept," in Global Strategic Management: The Essentials. ed. by Heidi Vernon-Wortzel and Lawrence H. Wortzel. New York: Wiley, 1990.
- Wolk, Martin. "Defense Companies Seen Benefitting from Cost Cuts," Reuter Business Report, Jul. 3, 1994. Available: NEXIS Library: NEXIS File: CURNWS.
- Zakheim, Dov. "Industry Will Reshape Itself; but Government Must Still Assist Foreign Sales," Defense News, Mar. 21, 1994, p. 24. Available: NEXIS Library: NEXIS File: CURNWS.

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